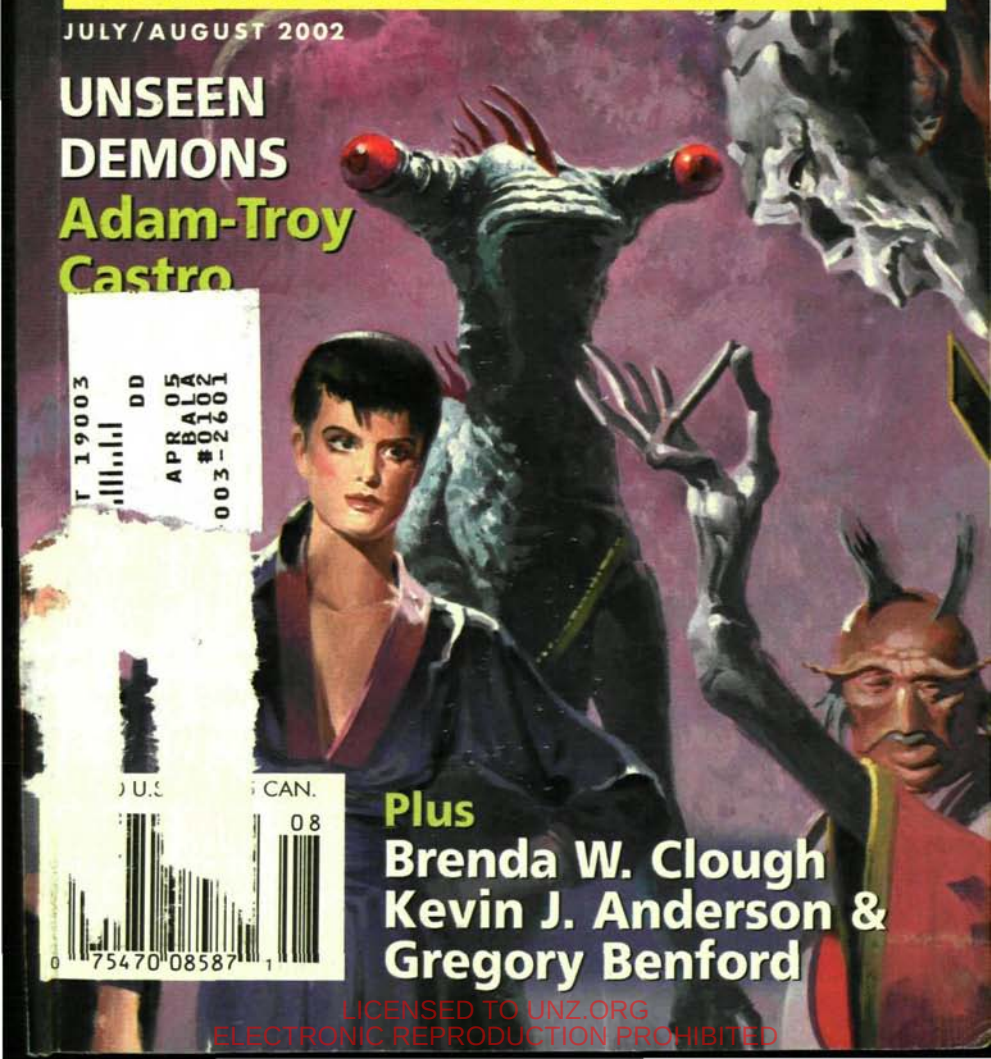
SPECIAL DOUBLE ISSUE

# ANALOG

SCIENCE FICTION AND FACT

JULY/AUGUST 2002

## UNSEEN DEMONS
Adam-Troy Castro



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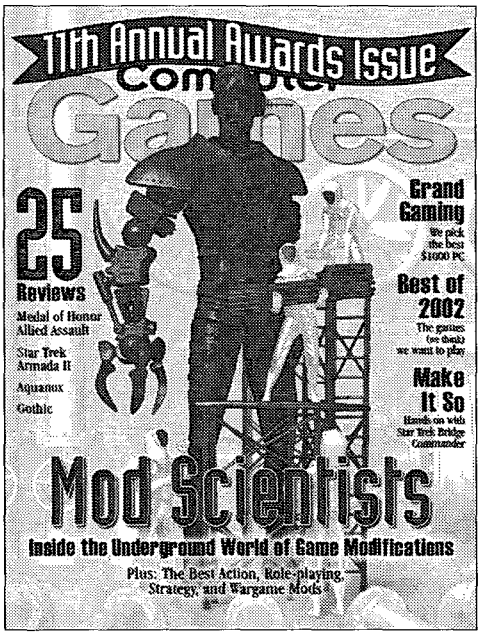
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# ANALOG

## SCIENCE FICTION AND FACT

Vol. CXXII No. 7 & 8
July/August 2002

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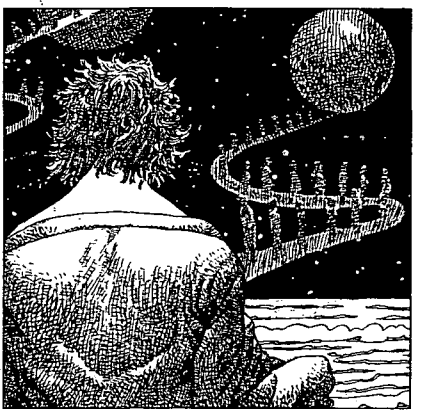

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## EDITORIAL Stanley Schmidt

# ECORESTORATION

A while back (in "Authenticity," June 1994) I considered the central problem of historical restoration: When you set out to restore, say, a building to its "authentic" state, what *is* its authentic state? A building that has stood and been used and lived and worked in for a long time will surely have gone through many changes. Many different conditions are parts of its real history, and there's a certain arbitrariness in picking any one of those conditions to call its "true" character.

In recent years we've begun to hear more and more about an analogous problem in what might be called "ecological restoration." Having "conquered nature" so thoroughly that we no longer have to worry about keeping literal wolves from the door, our civilization can now afford to contemplate such questions as whether we've gone too far in remaking the world in our own image. Maybe it wasn't really necessary to drain as many swamps and marshes as we did. Maybe it would be nice to reinstate some of them, not just for esthetic or charitable reasons, but because we belatedly realize we *need* them—as parts of a natural water purification system, for example, and as nurseries for marine animals we depend on as food. Maybe we even need literal wolves, if not at our doors, at least as top predators in ecosystems where they once did that job and nobody's doing it now.

So we hear rather often now about attempts to restore wetlands or to reintroduce animals extirpated from their former ranges. Bison were nearly hunted to extinction on our Great Plains in the late nineteenth century and have now been reintroduced to several areas with some success. Pronghorn antelope didn't come quite as close to the edge, but they've made even more of a comeback. Elk (or wapiti), once found through much of the United States but long gone from most of it except parts of the west, have recently been reintroduced to a few eastern locations such as Great Smoky Mountains National Park. Wolves are generally considered to have been completely wiped out in the Lower Forty-Eight, with the sole exception of northern Minnesota. Lately they have been reintroduced with some success (and over considerable objection from nearby humans) to a few places like Yellowstone National Park, and attempts are being contemplated in other places (more on that later).

Ecological restoration, like its architectural counterpart, necessarily involves a decision about which period to restore. The part of southwestern Ohio where I grew up, for example, used to have its own populations of deer, elk, and wolves. They were all gone before I got there, but the deer have now returned. Should the residents attempt to bring back those other species? Should they try to restore the conditions of some millions of years earlier, when the whole area was an ocean bottom and home to crinoids and brachiopods? Or


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should they forget about the past and just try to optimize present conditions for themselves?

Ecological restoration, as that example illustrates, presents an additional problem: Often, even if you decide what you'd like to recreate or reintroduce, doing so isn't a realistic goal. You couldn't bring back the crinoids and brachiopods without bringing back the ocean. Even if you wanted to do that, you couldn't. The topography has changed too much; the area is now relatively high country full of hills and drained by a river system. You could bring back the elk or the wolves, but bringing back either without the other—in proper proportions—would risk causing serious problems (as deer already have in many areas where they've come back in abundance without compensating predators).

So when you start trying to reintroduce lifeforms that have long been absent from an ecosystem, you face a whole series of interlocking questions about whether it *can* be done, and, if so, how and to what extent it *should* be done. Sometimes the answers are fairly obvious, as in the case of the Midwestern ocean critters or the dinosaurs in *Jurassic Park*. Even if you managed to recreate the organism (and that may well be possible soon), most of us agree that *Tyrannosaurus rex* just wouldn't fit in, at least in *our* neighborhood[1]. And even in more apparently benign cases, things may be more complicated than they seem.

How about passenger pigeons, for example? Beautiful birds, astoundingly abundant over much of the United States until well into the nineteenth century, considered an inexhaustible resource, and hunted into oblivion with just as astounding rapidity. Wouldn't it be wonderful if we could bring them back?

Well, maybe, and not just for the beauty and spectacle of those vanished flocks. Back in June 1990, biologist David Steadman pointed out that if the Earth's climate continues to warm because of increasing greenhouse effect, ecosystems will need to redistribute themselves, and large numbers of passenger pigeons could have been a big help in doing that. In particular, the zone suitable for North American forests will shift northward, their present southern regions becoming too hot as areas beyond their present northern boundaries become just right. But forests can't spread into the newly suitable places unless something carries their seeds there. Animals like squirrels, crows, and jays can do that, in a very

[1] Incidentally, long before *Jurassic Park*, *Analog* published an interesting short story on this idea: Robert R. Olsen's "Paleontology: An Experimental Science" (August 1974), told as a series of research papers with a steadily decreasing number of coauthors.

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limited way, but huge flocks of passenger pigeons could have done it much more efficiently.

It occurred to the title character of my story "Johnny Birdseed" (*Analog*, July 1993) that it might be possible to arrange that by cloning passenger pigeons from bits of museum specimens. But would it really be a good idea? As John W. Campbell was fond of pointing out, you can't just do one thing—any action has side effects. When North America had sky-darkening flocks of passenger pigeons, it also had more forests (at least at first) and more predators. Those avian swarms could move a lot of seeds, but they also ate practically everything in their paths and broke down trees in their nesting areas with the sheer weight of their numbers. Could our present country, with its much larger human population and very different patterns of land usage, absorb them? Quite possibly not without considerable difficulty and collateral damage.

You can't restore a vanished ecosystem by bringing back one piece of it. What you're really doing then is not restoring the old, but disrupting the new. And the new may not be able to take it.

Finally, even if you have a fairly simple case of an ecosystem that's *almost* what it once was, so that you might have a fighting chance to restore it by reintroducing one piece of the puzzle, is it necessarily best to use an exact replacement, or might something a little different work better? The question is a little like one often faced in historical restoration, and it leads us right back to our friends the wolves.

One of the most recent reintroduction projects I've heard about is one being debated (at the end of 2001) in northern New Hampshire. There are those who would like to reintroduce wolves to a large tract of wilderness there; and there are those who think it's unnecessary because coyotes, a formerly western animal that has now spread all over the Lower Forty-Eight and beyond, now serve the ecological function once served by wolves. And among those who think wolves should be reintroduced, there is considerable disagreement about *which* wolf it should be. Until recently, practically everybody assumed that the wolf that used to inhabit these forests was the gray wolf familiar in Canada and Alaska. But recent DNA analysis of museum specimens sug-

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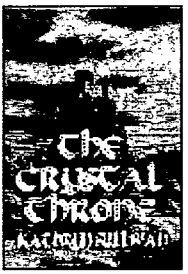


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gests that the wolf that used to be here was actually the closely related but distinct red wolf, formerly believed to be strictly southeastern (and almost extinct, but recently reintroduced in some southern locations).

Some biologists argue that the red wolf is clearly the one to bring back since it is the one that used to belong here. Others say that times have changed and the red wolf would no longer fare well here, because it is more likely to cross-breed with coyotes (formerly absent but now fairly common) and less able to kill the largest available prey animal, the moose.

What it seems to boil down to is that while the red wolf may be the original wolf of this geographical location, the habitat it occupied no longer exists and it may be less well suited to the *present* environment than the gray wolf. In other words, the "here" where it used to belong is no longer there. Even though present conditions are superficially much like the original, they may not be similar enough to fix by simply plugging in an exact replacement for a missing part. It may be necessary instead to find something new—in this case, a different species of wolf—that best fits conditions as they *are* rather than as they used to be.

And that, we can reasonably expect, will quite often be the case when people attempt "ecorestoration."■



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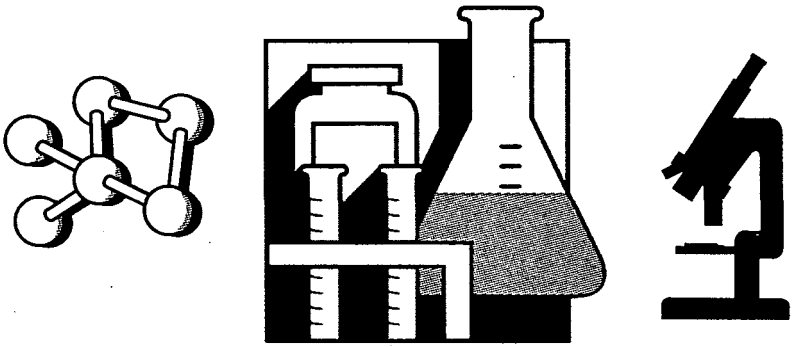
# THE ANALYTICAL LABORATORY



Our thanks once more to all of you who voted in our annual poll on the previous year's issues. Your votes help your favorite writers and artists by rewarding them directly and concretely for outstanding work. They help *you* by giving us a better feel for what you like and don't like—which helps us know what to offer you in the future.

We have five categories: novellas, novelettes, short stories, fact articles, and covers. In each category, we asked you to list your three favorite items, in descending order of preference. Each first place vote counts as three points, second place two, and third place one. The total number of points for each item is divided by the maximum it *could* have received (if everyone had ranked it #1) and multiplied by 10. The result is the score listed below, on a scale of 0 (nobody voted for it) to 10 (everybody ranked it first). In practice, scores run lower in categories with many entries than in those with only a few. For comparison, the number in parentheses at the head of each category is the score every item would have received had all been equally popular.

NOVELLAS (2.00)

1. "Sunday Night Yams at Minnie and Earl's," Adam-Troy Castro (4.21)
2. "The King Who Wasn't," Lloyd Biggle, Jr. (2.19)
3. "Bug Out!," Michael A. Burstein & Shane Tourtellotte (2.08)
4. "Pele," Poul Anderson (1.93)
5. "May Be Some Time," Brenda W. Clough (1.80)



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NOVELETTES (0.87)

1. "Tower of Wings," Sean McMullen (1.71)
2. "The Upgrade," Brian Plante (1.51)
3. "First Contact National Monument," Rick Shelley (1.32)
4. "The Return of Spring," Shane Tourtellotte (1.23)
5. "The Rise and Fall of Paco Cohen and the Mariachis of Mars," Ernest Hogan (1.21)

SHORT STORIES (0.67)

1. "Jake, Me, and the Zipper," Rajnar Vajra (1.53)
2. "What Weena Knew," James Van Pelt (1.44)
3. (tie): "Resurrection," James Van Pelt (1.19)
   "Fresh Air," Brian Plante (1.19)
4. (tie): "Going, Going, Gone," Stephen L. Burns (1.00)
   "Christmas at Ground Zero," Linda J. Dunn (1.00)

FACT ARTICLES (1.82)

1. "Up in Smoke: How Mt. St. Helens Blasted Conventional Scientific Wisdom," Richard A. Lovett, Ph.D. (3.52)
2. "He Who Carried the Moon," Dean McLaughlin (2.53)
3. "When Light Speed Isn't Enough: Creating Superluminal Computers," Dr. Casimer DeCusatis (2.27)
4. "Stemming the Tide of Aging and Disease," Kyle Kirkland, Ph.D. (2.11)
5. "Water, Pink Salt, and Cold Dry Gullies: Halobacteria and the Case for Life on Mars," Geoffrey A. Landis (1.88)

COVERS (1.82)

1. July/August (for "Bug Out!"): Bob Eggleton (2.95)
2. December: David A. Hardy (2.40)
3. June (for "Sunday Night Yams at Minnie and Earl's"): Kelly Freas (1.86)
4. September: David A. Hardy (1.71)
5. April: David Egge (1.6)

All categories had clear first-place winners this year, including the exceptionally strong showing by Adam-Troy Castro's "Sunday Night Yams at Minnie and Earl's." And while James Van Pelt didn't place first in short stories, he did place both second and third.

We're very pleased that the number of votes continues to rise as more readers discover how easy online voting is. Since AnLab votes are so useful to everyone concerned, we hope to get even more votes next year. Use e-mail or "snail mail," whichever you prefer, but please vote! (And please be careful to vote in the right category, as listed in the annual Index. Every year a few votes are wasted by being cast in the wrong category, and those simply can't be counted. If you didn't use the online voting on our website [www.analogsf.com] this year, you might want to try it next time; it makes that problem virtually impossible!)

Deborah Layne, of Wilsonville, OR, is this year's winner of a free one-year subscription in a random drawing from all ballots received. Next year that could be you—and the more votes we have, the more the results mean!



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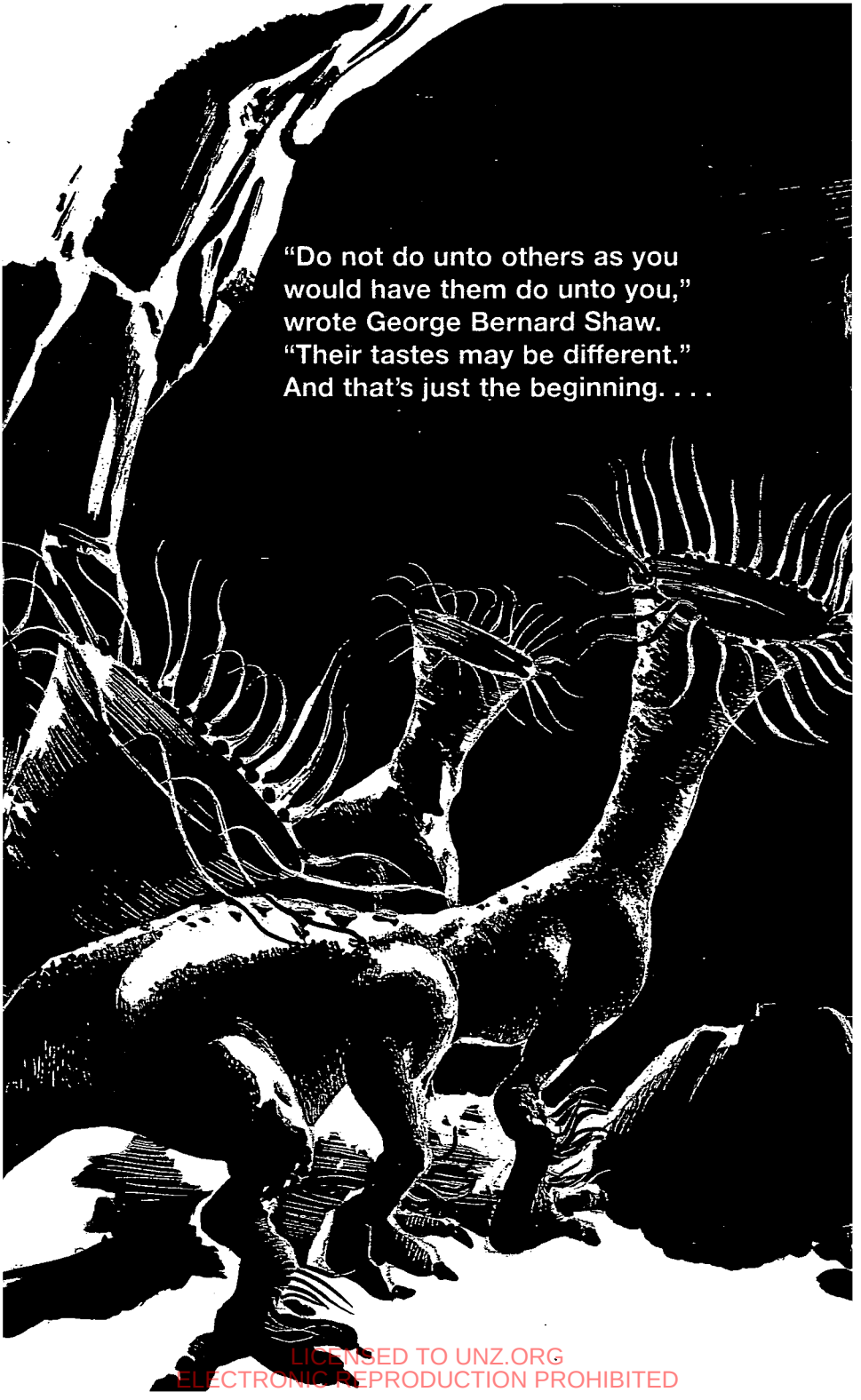
"Do not do unto others as you would have them do unto you," wrote George Bernard Shaw. "Their tastes may be different." And that's just the beginning. . . .

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# Unseen Demons

## Adam-Troy Castro

Illustration by Vincent DiFate

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He is going to get away with murder. They're not stupid; they understand the locals have limitations; they know why handing him over to them won't work. But that hasn't stopped them from painting us as coconspirators trying to cover up the latest in a long series of atrocities."

Cort grimaced at the thought. The long history of human relations with alien civilizations, both within and outside the species, had always been a study in trying to live down the crimes of the past. Crimes like those committed by the man in the cell—among others—provided plenty of ammunition to those who said the Hom.Saps had squandered the last of its second chances. Feeling tired, she murmured: "Are they at least going to give me enough room to work?"

"They'll make a show of it," said Whalekiller. "But they'll be on your back before you've been here twenty-four hours. Not much longer after that they'll be portraying you like you're as big a monster as he is."

Cort remembered a night filled with warring shrieks, and thought: *I am.*

It just didn't make the task ahead of her any less impossible.

**2.**

Catarkhus was just another lumpy rock, dominated by deserts but seasoned with a mixture of inland seas and rainforests that formed a verdant belt around its equator. Andrea Cort had seen enough to sate her before leaving orbit. The skimmer tour Whalekiller had insisted on providing her on the way to the briefing hadn't served to endear the place to her any further. Nor did the scent of the air, which was neither acrid nor perfumed, but the kind of instantly noticeable tinge that every new biosphere manufactured for its very own. Folks who liked worldhopping cooed that such grace notes gave each new planet a special signature. Cort had always found that they gave her a headache.

She couldn't help it. She hated worlds. Having spent all but the first few years of her childhood in a safe wheel-world habitat, and having devoted the majority of her legal career to constantly untangling the disasters that inevitably took place wherever human beings were allowed to interact with naturally evolving life-systems, she far preferred artificial environments. They at least could be forced to make sense. Worlds, by contrast, repelled her—and first-contact nexus or not, this one seemed more repugnant than most. As far as she was concerned, the other monster had lent it what little distinction it had by murdering several of the natives.

His name was Emil Sandburg; the file she'd been provided contained all the empty facts about his life without explaining why he would decide to start slicing up alien sentients as a hobby. He'd lived twenty-four years Old Earth Standard, an economic refugee from some failed industrial cooperative on the edge of Confederate Space. His indenture screening had listed him low normal in empathy, low normal in charisma, low normal in imagination; a determined nonentity who just happened to score extremely high normal in inductive thinking. He had been on Catarkhus for three years, forming distant but entirely cordial relationships with the rest of the embassy staff; he was reported to be reasonably competent at cooperative relations with the representatives of the seven other space-faring species maintaining first-contact embassies here.

Everybody had liked him, in the sense that everybody always likes people who don't get in the way. Nobody could claim to know him. They had called him bland, forgettable, free of personality. Dull. They had seen no indications that he was in any way deranged. But now it seemed that on at least six separate occasions during his tour of duty here, he had descended into the underground



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colonies of the native sentients, isolated random individuals among the population, and taken his time cutting them to pieces. He might have indulged this hobby indefinitely if a representative from the Riirgaan delegation hadn't discovered one of Sandburg's murders in progress.

Cort was scheduled to talk to the Riirgaan in question later this afternoon, and she was supposed to have a meeting with the local interspecies council as soon as she produced her recommendations; if she was lucky, and the council was feeling sufficiently charitable, she might be able to establish some moral distance between this one demented human and the rest of the species that had spawned him. But it was going to be tough. After the Hossti debacle, and the (*Tone*)-Shtok crisis, and the embassy massacre on Vlhan—(three spectacular diplomatic incidents that had within the past year left interspecies confidence in the good faith of human beings at an all-time low)—the diplomatic community wasn't exactly motivated to give the perpetually bumbling Hom.Saps the benefit of the doubt again.

3.

The Hom.Sap. embassy had no jail facilities, so Sandburg's cell was a hastily-converted quarantine booth tucked away in the embassy's on-site clinic. The one guard was a skinny, and somewhat sheepish, first-year indenture armed with nothing but a cryogenic foamer; even so, he wasn't trained for security work, and the pretense at high security rendered him almost apologetic as he dampened the door field to allow her admittance. Having won her argument with her security-minded escort Whalekiller, she went in alone, noting a handful of realbooks and a scan-only hytex before the figure on the bed had time to demonstrate how he was going to react to her arrival.

It turned out to be with a shy smile and an extended hand. "Hello."

"Hello," she said, without returning either.

Sandburg let his hand remained extended for five full seconds before dropping it with a fatalistic shrug. "You're a new one."

"Just landed." There was no place to sit other than the cot, which she wouldn't have wanted to share with him, so she remained standing. "I've traveled a long way to see you, Emil."

He flashed a tentative grin, forcing her to upgrade her assessment of the smile: it was not warm so much as insolent. "Oooh. Officialdom."

"Andrea Cort. Legal counsel for the Dip. Corps judge advocate."

"Big-time officialdom," he said, his grin acquiring several additional degrees of off-center tilt. "Took you long enough to get here, ma'am."

Cort, who had spent the last two subjective months of her life being sick to her stomach at high g, didn't particularly need to be reminded. "Well, I'm here now."

He appraised her. "I don't know whether I ought to be real happy about that, ma'am. I mean, you are a pretty lady and all, and I love your legs, but you were sent here to make sure I get a proper lynching, weren't you?"

This was the man cited as bereft of personality? His current persona was obnoxious, but that was as far from bland as he could get. "I'm not your prosecutor, Emil."

"Maybe not, but I can sure as hell see in your eyes that you wish you were part of the jury." He chuckled without bitterness at that, thus establishing himself as a man who expected to be hated but didn't give a shit. He patted the mattress beside him. "It's not a sexual overture, pretty lady, but I really do wish you'd sit down. Otherwise, I'm going to get a crick in my neck just talking to you."

He meant it to be disarming, but just being in the same room with him was enough to raise the acid levels in her belly. "There's a solution to that, Bonds-



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man. You can stand. In fact, I'm going to require you to."

Sandburg rolled his eyes, but clapped his hands against his knees and rose to his feet with the air of a long-suffering martyr. "Yes, ma'am."

Cort wished she had a paper to look at, a docreader to scan, even a colleague to pull off to one side and consult; anything to delay the rest of the interview by the two or three beats she needed to compose herself. "I'm told that you were caught in the act of disemboweling a Catarkhan whose limbs you had already amputated; that in the time since your initial arrest you have confessed to committing the same crime at least half a dozen times in the past. I have also been told that you say you did this for no reason other than your own personal recreation. Is all of this accurate, Emil?"

"They've briefed you real well, ma'am."

She went nose-to-nose, so her words could burst against his skin in puffs of breath: "You enjoy killing things, Emil?"

His eyes remained amused. "Sometimes."

"Torturing them?"

"That's the fun part."

"You tortured the Catarkhans?"

"Not sure the word applies in this case, ma'am. Not with this species."

Neither was she, damn him. That was part of the problem.

"For the sake of the argument: you enjoy slow kills?"

"Sometimes, ma'am."

"Do you only do it to Catarkhans? Or have you ever practiced this particular hobby on other sentients?"

He showed teeth. "None of your damn business. Ma'am."

She knew then, as she was meant to know, that he had; that somewhere in his past, on some other world he'd known, there had been other bodies left behind in dark places. He had probably enjoyed the usual childhood experimentation on animals, and might have taken down a few human beings before hitching his star to the Dip. Corps gave him the opportunity to indulge himself with a wider variety of sentients. Maybe she could link him to some unsolved crimes in his past, wrest jurisdiction from the locals, and resolve her current dilemma that way—but somehow, she already knew that she would find nothing. A monster like Sandburg wouldn't be so playful if he thought the game was going to be that easy for her. So she smiled back at him, with equal unpleasantness. "All right. This is a Catarkhan matter. I'll confine my inquiries to the matter of the dead Catarkhans."

He nodded. "That should save us some time, ma'am."

"Why did you do it, Emil?"

"You ever stomp on bugs, ma'am?"

(She remembered a shattered and bleeding alien form, unable to rise, trying to ward her off with imploring hands; the face behind those hands so swollen from previous beating that it was nearly unrecognizable, the eyes still clearly those of a being she had once considered a second father.)

"You find that an appropriate description of what you've done?"

"Pretty much, yeah. Watch them for a while and tell me it's not."

"These so-called 'bugs' were sentient beings."

"That's what you people keep telling me," he said, without any particular heat. The crooked smile came back. "Personally, I don't see it."

"Is that your defense? That they weren't sentient?"

"I don't know if they are or not. I just don't see it, that's all."

The bastard wasn't intimidated; he wasn't even worried. He knew that all diplomatic precedent placed him outside the reach of human punishment. He also knew that the very nature of the creatures he'd killed probably placed him outside the reach of their punishment as well. She had to hand it to him; he'd chosen a perfect species to victimize. But she moved closer to him and


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said: "You committed six murders, Emil. If you think I find anything cute or endearing about that, or have any interest in what you see or don't see, you're even sicker than I thought you were. I promise you, I will see you pay for that."

"A lot more than six," he said, still without any particular heat. "And yes, I did enjoy myself doing it; it's really not like there was anything better to do on this rock. But if you want me to pay for it, you do have a problem, don't you?"

"One I'll solve. You can be confident about that."

He yawned in her face. "Yeah. Right. I think we're done with this conversation, ma'am. I need a nap."

He sat down on the bed, rolled over on his side, and began loud, theatrical snoring.

Cort stood there staring at his back for a while, contemplating the attractions of pure, unadulterated sociopathy. Her work had placed her in close proximity with several specimens of this type over the years (as many behind desks as behind bars), and her reaction had always been the same: the instinctive, natural revulsion almost matched by something else she had come to acknowledge as envy. She tried to imagine what it was like, for people like Sandburg, being able to live their lives with absolutely no internal governors, to be able to do anything they could manage to get away with without later feeling shame or regret or even embarrassment at the worst of what that meant. It must have been an interesting form of freedom. Not one she liked being able to recognize as human, and not one that she would ever want to live herself, even if it made it easier to bear the blood on her own hands—but one as compelling, in its own way, as any other alien form of life. Which was just one of the many good reasons she was determined to destroy him.

She turned and headed toward the exit.

He called before she got there. "Oh, one last thing? Andrea?"

Unwillingly, she turned. "Yes?"

His smile was now broad, confident, hateful.

"Good luck finding yourself a judge and jury."

4.

Roman Whalekiller was smart enough to recognize Cort wanted silence and professional enough to give it to her for almost five minutes. They were on their way out of the embassy hospital when he demonstrated that he wasn't going to let it last forever. "Are you all right?"

"Yes." Her tone underlined just how much she resented the condescension.

"I'm sorry. It's just that you look a little shaken . . ."

"It's the air; a little thinner, here, than I'm used to. Get me down to the plains where your aboriginals live and I'm sure I'll look a lot better."

"If you say so," Whalekiller said, providing official agreement wedded to the texture of denial—always a diplomatic specialty.

It irked her. "He's not my first murderer, Bondsman."

Whalekiller stiffened at the title, reminder of the gulf between his mortgaged status and her freewoman rank. "I know that. I'm sure you've known many of them."

She shot him a glare, certain she heard rank accusation in his words—then realized he had been referring to the people she met in her role as advocate. "A few," she said. Then, seeing she'd already shown a little too much arrogance, and knowing it would do her no good to pointlessly alienate this man, she retreated: "I can't say it's something I've ever gotten used to."

"That's good," Whalekiller said, his tone so dry it was impossible to determine whether it was conciliatory or sarcastic.

They left the embassy hospital, then crossed the quad, a cheery acre the Dip. Corps indentures had gone to far too



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much effort designing. With offworld flora a forbidden element, they'd transplanted trees and shrubs and grass-analogues from all over Catarkhus and arranged them in oval plots set off with arrays of polished white glowstones, with a Dip. Corps flag fluttering atop a pole in their midst. The overall effect was neither human soil nor Catarkhan, but some uneasy graph position that lay midway between the two extremes. There weren't many people visible; even now, with the crimes of Emil Sandburg still casting its pall over the human presence here, most of the research personnel had better reason to be elsewhere on the planet. But a group of three young indentures who were sharing lunch and buzzpops under the warm Catarkhan sun did look up as she and Whalekiller passed, with something like morbid fascination in their eyes: *That's her, that's the advocate, that's the one they sent to deal with the Sandburg problem.*

She was afraid they'd try to delay her with conversation, but they were too well-trained; they knew urgency when they saw it. They let her and Whalekiller pass.

She thought that meant she was home free.

Then Whalekiller led her through the arched corridor that bisected the staff dormitory, rounded a long white structure of uncertain purpose, saw what was waiting for them by the vehicle hangar, and muttered a long, eloquent: "Shit."

The four aliens waiting for them by the entrance to the hangar—a squat little Bursteeni, a cadaverous long-necked Tchi, a gravely expressionless Riirgaan, and a hovering flatscreen representative of the AIsource—were no doubt officially visiting the Hom.Sap. embassy compound for reasons that had nothing to do with Cort's still-embryonic investigation. After all, first-contact delegations did have to share their data from time to time, and some of that information exchange was best performed on-site. But it was still convenient for these four, appearing here at this time, on this day, representing such a neat cross-section of the interspecies mission to Catarkh, to so carefully position themselves in Cort's path. Whatever they had been talking about, if it was anything other than concocting a common excuse for their presence, they immediately stopped and converged on Cort and Whalekiller.

"You don't have to speak to them now," Whalekiller said. "You haven't even been out in the field yet."

Cort, of course, knew that; but she also knew that as the official charged with settling the Sandburg problem, she was also bound to function as the whetstone necessary for the grinding of certain axes. "Don't worry about it. We're going to have to get this out of the way sometime."

The Tchi, an angular string of a creature topped with a thatch of curly gray hair, was the first to accost her. He raised his patrician chin and murmured, "Excuse. You are the Hom.Sap. legal counsel known as Andreacort?"

She wondered how her name had circulated so quickly. "Yes. Can I help you?"

The round little Bursteeni, demonstrating its species' tendency toward excessive enthusiasm, bounced up and down with excitement. "It is an honor to meet you, Counselor Cort. I am Mekile Nom of the Bursteeni delegation, and I understand that you have had a long and distinguished career dealing with questions of legal jurisdiction—"

"A career," the Tchi said, its dust-dry air of innate superiority immediately cutting its friendlier colleague off in midsentence, "that achieved such impressiveness mostly because her species has provided her since her very early childhood with many opportunities to investigate criminal acts on alien soil. No doubt, if her people continue to wreak havoc among aboriginals, she will have


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many more chances to display her talents—a state of affairs that, demanding as it might be for her, still presents what has to be seen as a remarkably ugly display by humanity. Your weak standards betray you here, Mekile; I myself would hesitate to call that excellence." It turned a measuring gaze toward Cort, and said: "Allow me to introduce myself. I am Counselor Gayre Rhaig, of the Tchi Republic's own Committee on First-Contact Violations. I arrived on-world twenty-two local days ago, and have been busily conducting my own investigation as insurance against the expected human attempt to subvert justice in this matter."

Cort did not smile, but she didn't raise her voice either. "I can assure you, Mr. Rhaig: subverting justice is absolutely the last thing the Hom.Sap. Confederacy has in mind."

"Your own presence here provides strong evidence to the contrary. I have already established from my own research that you supported human over native jurisprudence in at least 60 percent of the cases you've investigated. How do you intend to justify such gross misuse of your power in this case?"

This was another diplomatic specialty that some representatives of the Tchi had always been able to practice with special skill: the kind of question that, like "When did you stop beating your wife?", allowed no nonincriminating answer. Cort hid her annoyance behind a content-free: "I'll be happy to answer your questions when I've completed my investigation."

"Of course," Rhaig said. "Given the poisonous extent of Hom.Sap. chauvinism, you first have to determine whether they're sufficiently similar to your own species before you decide whether you can be forced to acknowledge the grievous sins committed against them."

Whalekiller broke in: "Well, that shows real impartiality, Goodsir . . ."

Though sharing his anger, Cort deferred the remainder of his words with a gesture. She said: "We don't need to be forced, Mr. Rhaig. Nobody, except possibly Sandburg himself, minimizes the seriousness of his crimes."

"Then why is he still in Hom.Sap. custody, except to deny the indigenous people of this planet an opportunity to judge him?"

"You know why," Whalekiller said.

"I know the reason alleged to be why. I have yet to see proof that the Hom.Sap. embassy intends on using it as anything more than a convenient excuse."

Cort said: "We need to establish that the Catarkhans have the capacity to judge him."

"Ah," said Rhaig. "And if you determine they have no capacity? Given the demented history of your own species, what makes you believe that you possess such capacity yourselves?"

There were any number of answers Cort could have given to that: the diplomatic answer, the legal answer, the defensive answer, even the angry answer. None of them qualified as the definitive answer; none of them provided anything like a sufficient rebuttal to all the human history Cort knew to be written in spilled blood; none of them erased her own vivid memory of bodies falling on a clear, sun-dappled morning.

Before she could speak, the representative from the Riirgaan delegation cut in, with the high-pitched trilling that provided his species' closest equivalent to laughter. "Indeed. None of us envy your task, Counselor. It is difficult to come up with answers to questions that do not permit the existence of any. But it is your fellow human Sandburg who has placed you in that position."

"He certainly did," said Cort. "But I will find the answers."

"Then we will all no doubt be very interested in hearing your proposals."

The flatscreen from the Alsource flashed agreement: WE ARE ALL MOST INTERESTED IN JUSTICE.

In context, it sounded as challenging,



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and as threatening, as the monster Sandburg's crack about finding a jury.

After all, as she'd been told again and again, justice on Catarkhus was probably not a possibility.

But then, she was used to that.

5.

As Whalekiller piloted their skimmer high over the Catarkhan desert, the paucity of cloud cover ensured a constant, clear view of the streaked landscape below; it was a dull pattern of light brown against slightly darker brown, with the darker areas representing cultivated sections farmed by the oft-discussed aboriginals. On their first flight over, Whalekiller had rhapsodized about how beautiful it was. Cort couldn't see it. Maybe it was as magnificent as he said, and maybe (as she suspected), people who got assigned to the same world for too long became so starved for beauty that they created some out of their own heads.

Timing was all. No sooner had she registered Whalekiller's appraising look than he opened his big mouth again. "I hate Tchi."

She glanced at him. "Odd thing for a diplomat to say."

"I know. By contract, I'm supposed to respect everybody. And I really try. I like the Riirgaans, I like the Bursteeni, I even enjoy playing logic games with AIsource . . . but the Tchi, and their air of incessant superiority, make me want to bang my head against a wall. Does that make me a bigot, Counselor?"

"No," she said. "It makes you what the Tchi want you to be. They do it on purpose, you know."

"What? Act obnoxious?"

"That does happen to be one way of putting it, but their culture teaches them to treat most social interactions as a series of verbal challenges; they tend to keep upping the ante until their opponents either overcome them or back down. They're very aggressive about it, particularly against those they imagine capable of pushing back . . . which makes it hard to tell whether somebody like Rhaig is just following protocol or preparing to be a real threat."

He glanced at her. "And here I thought they were just assholes."

"Most of them are," she said, with spooky calm. "But culturally so."

"And what do you make of Rhaig, specifically? Is he just giving you the closest Tchi equivalent to a friendly hello, or is he really going to be a problem?"

"I'm not sure yet," she said. But she was already thinking: *A problem.*

He blinked at her. "Something else I picked up during that meeting. You don't like aliens much, do you?"

Cort clicked her thumbnail against her incisors. "They're all right."

"You're uncomfortable around them."

Another click. "I'm uncomfortable around everybody."

Whalekiller's brow furrowed. "Shyness, Counselor? I wouldn't have believed it in a woman capable of rising to your position."

"It's not shyness, but preference. I just don't have a very high opinion of sentient life in general."

The furrows grew more furrows. "All sentient life?"

"That's right. Human, Alien, AI, In-Betweeners, Combinants. You show me something that can think, and I'll show you something that can't be trusted."

Whalekiller's mouth worked in ways common among people trying to determine just how seriously they should take her. "But you can think, Counselor."

"I can think, I'm sentient, and I don't count myself as an exception."

"Ummm. Leaves you with a limited number of choices as far as friends are concerned, doesn't it?"

"One reason," she said, making sure he received the eye contact, "that I've never been particularly interested in looking for any."

He turned away from her and studied



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the empty airspace ahead of them—a pretense of active involvement in the skimmer's flight that might have been persuasive if she hadn't seen him load their destination. After a while, not looking at her, he said: "Would you be very offended if I told you I found that sad?"

"No," she said. "You can find it any way you like."

Whalekiller left it at that, fortunately. Had he questioned her further, she might have been forced to explain that she'd derived her opinion honestly, from years of personal and professional experience. She might have said that she'd seen genocide close up as a child; she might have said that she'd seen madness as an adult; she might have said that she'd seen brutality as an advocate. She might have said that the ability to think carried with it the potential for joy, but also the potential for self-torment. She might have said that it made bad things happen, and that any species capable of sustained abstract thought spent much of its existence piling those thoughts into rickety, unwieldy, top-heavy structures . . . some of which made sense, some of which were downright brilliant, and some of which were top-heavy nonsense that needed constant attention to keep from collapsing under their own weight. She might have concluded that while sentience was the source of all human and alien civilization, it was also where all evil and madness came from. It was, after all, where people like Emil Sandburg came from. In the end, she might have said all that, and found herself unable to hold back all the other places those dark, damnable, never-silent thoughts had taken her.

Maybe ten minutes passed before Whalekiller, who probably felt as oppressed by the silence as she did, cleared his throat. "Counselor?"

"Yes?"

"I've got to ask you: that thing the Tchi said, about you favoring humans in so many jurisdiction disputes? Is that true?"

Relieved to be distracted by business again, she brushed a strand of black hair away from her face, and said: "No. It's a gross distortion."

"I figured as much," Whalekiller said, in a tone that testified to long personal experience with diplomatic carping. "What precisely did he leave out?"

"The fact that none of the cases I managed to flip to human courts were ever about crimes committed against native sentients. They may have been committed on alien soil, but they were all human-on-human crimes—disputes between Dip. Corps personnel, ranging from petty theft to one particularly stupid murder. The indigenes were always entitled to jurisdiction if they wanted it, but I was always able to persuade them that humanity was the injured party and therefore entitled to our own justice. If they agreed to extradition, it was because they were relieved they could."

"Wish you could manage that in this case," said Whalekiller.

"So do I," Cort said. "It would make things a lot easier."

He hesitated. "You ever surrender somebody like Sandburg to the locals?"

"Somebody like Sandburg? No. I've never had anybody like Sandburg." The unwanted thought: *I've had worse; I've been worse*. "But I had a case not too long ago: some indenture hiking cross-country got caught in a rainstorm, hid out in a cave, took a leak in there while he was at it. Some pilgrim saw him doing it and accused him of desecrating a holy tomb. The punishment was public flogging followed by banishment. We didn't even fight that one: the guy was a real do-his-duty type, said he could take ten lashes if it meant honoring native law. We gave him something to deaden the pain, fixed him up afterward, then reassigned him. It probably helped his career, actually. I think he's now an ambassador somewhere."

"But he didn't really feel the punishment."

"We didn't think he deserved any,"



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Cort said. "The site wasn't marked and hadn't been mentioned before. He just did what came naturally, and handing him over kept the indigenes happy without doing him any permanent damage. Sandburg, on the other hand—"

She let the sentence trail off.

He finished it for her. "—deserves anything they could possibly do to him."

She nodded. "Did you know him, Bondsman? I mean, before?"

"Know him? I think it's pretty clear that nobody knew him. If we'd known him, we would have shipped him offworld before the damage was done."

"But did you think you knew him?"

Whalekiller considered that. "I think I tried talking to him three, four times. Casual conversation. He was polite enough. He tried to be friendly. But the man had nothing to say. Everything he said was just . . . empty. Like everything he said was being edited by a committee intent on making sure that nothing of any real content ever escaped his mouth." He shivered. "I don't know. Maybe that was as close as he could come to normal. Maybe the only alternative to being a nobody was revealing what a sick bastard he was every time he opened his mouth."

"Maybe," she said, trying to reconcile that with the cocky Sandburg she'd interviewed.

"One thing's for sure, Counselor: whatever's in this head of his is downright evil. The Riirgaans provided footage of what he did, and it's enough to make you ashamed to be human." He closed his eyes, shook his head, and said: "It's too bad. About our problem, I mean: Too bad the Catarkhans don't have laws."

"Yes. It certainly is."

She fell into silence as she watched the endless brown of the Catarkhan desert passing by far below. It would indeed be easier if Sandburg could only be extradited. The Dip. Corps would have made damn sure he received the maximum punishment for his crimes—if not out of moral outrage, then at least out of concern for its own reputation. But Emil Sandburg's offense had been a crime of violence against locals, a distinction that, under the First-Contact Protocols supported by all the major spacefaring races, required trial under the local version of justice.

It didn't matter a whit that in this case, there was no local version of justice, or of crime, or of right and wrong. Nor did it matter at all that there was no way, short of warfare, that adherence to the policy could be practically enforced against any spacefaring race that decided in any given situation to ignore it. The policy was still seen, and treated, as an inviolate rule, one which all the major spacefaring races had instituted to minimize the kind of disasters that so frequently occur when one culture decides to run roughshod over another. Failing to honor it, even here, would seriously damage humanity's prestige and moral capital and whatever right it had to claim that the worst of its sins was in the past.

The locals had to provide judge and jury.

Even if they had no such thing. Even if they had no distant equivalent.

Even if, as in this case, they might have been incapable of ever understanding that a crime had been committed.

## 6.

One of the worlds Cort's work had inflicted upon her in the past boasted a herbivore the local aboriginals had given a name that sounded like a slow air leak. The closest human analogue to the sound was a sibilant sssssss, pronounced in a barely audible whisper. The abos called it that because the beast moved at a rate that seemed about as fast as erosion, blinking maybe once an hour, breathing about twice that much, reacting to everything that happened in its vicinity half an hour after it had passed into the realm of history. The beast was fortunate to be as stupid as a


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brick, since any creature with greater intelligence would have been driven insane by the boredom of its own existence.

The Catarkhans were downright manic by comparison, in that when excited they moved at roughly half the rate of human beings assaying a relaxed walk. They were sluggish, but just enough to seem more deliberate than decrepit. Had they shown any awareness of anything happening anywhere around them, the trait might have been endearing. But they were easily as oblivious as the sibilant-s herbivores Cort remembered; the world around them was simply not part of their equation.

"They have no justice system," Whalekiller explained, soon after they landed. "They have no laws, no societal structure, no philosophy, no religion, no rituals, no real sense of the individual, and no behaviors that seem independent of whatever's hardwired into their genes."

Cort's thumb was starting to ache from all the nibbling. "Have we ever been able to conduct any kind of communication with them at all?"

"Are you kidding? We haven't even been able to alert them we're here."

The Catarkhans were gray, but not elephant-gray; elephants have character, and Catarkhans had nothing of the kind. Imagine a gray that was not just the absence but the thoroughgoing rejection of color. Imagine a gently-curved kidney of a torso about .75 of a meter in length; an inverted cone of a head that would have been entirely featureless if it didn't provide space for a brain and didn't have a thicket of perpetually-writhing cilia around the perpetually-open mouth. Imagine no teeth and no tongue and no fixed jaw, just a solid funnel leading right down the gullet. There were six limbs, each articulated with two knees apiece, the lower set lined with a layer of cilia somewhat finer than that which bracketed the mouth. There were clumsy grasping appendages, a compromise between hands and feet, at the bottom of those limbs; they were just strong enough to pick up and manipulate small objects, which usually meant the globby mash Catarkhans directed toward that cavernous mouth.

Catarkhans could dig, and in fact they lived in hives. But the excavation took forever and required the constant effort of hundreds in order for any real progress to be made. Individuals were very weak in relation to their size, and weighed about as much as a bubble of hollow flesh—one of the main reasons Emil Sandburg would have had no problem overpowering one. A small human child probably could. But that wasn't the least of their shortcomings.

The greatest of those was that they were practically insensate. They were islands unto themselves. They perceived almost nothing. They were blind and deaf because they had no accommodation for eyes and ears; they had an at best rudimentary sense of smell thanks to the chemical receptors in their cilia, but that was just enough to recognize food, and perhaps smell it, certainly not enough to distinguish tastes. Nor was there any pain center in their brains; shoot them, cripple them, shatter their limbs, set fire to their skins, and they just blundered on, dragging the nonfunctional parts of themselves out of sheer inability to recognize their injuries. The only sense they had in functional quantities was tactile, and that on only a relatively small part of their bodies—the cilia that lined the limbs below each second knee. If they were removed or incapacitated, the Catarkhans were cut off from the rest of the Universe, reduced to bubbles of empty consciousness unaware even that there was anything around them subject to awareness. It was no wonder their life-support behaviors needed to be hardwired; otherwise, they would have survived as a species only as long as it took the entire population to starve.

Cort found standing in the midst of



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thousands of them, who inched along the ground in multiple files as they headed toward the cultivated farms that surrounded their hive in concentric circles, a lot like not existing at all.

It was her first encounter with the creatures the law had so perversely designated her jury pool.

After about ten minutes of silent observation, she said, "Shit."

"You're beginning to see the size of your problem."

"I saw it before, Whalekiller; I'm just now beginning to feel it. There's no way to interact with them at all?"

"Try it, why don't you?"

Hesitating only a moment, Cort reached out and pulled one of the deaf-and-blind marchers from its parade. The hardest thing about that was figuring out where it was safe to touch one; they had no real offensive capabilities, so there was no possibility of its being able to hurt her, but she had no intention of hurting it and therefore ending up another diplomatic nightmare occupying the cell next to Emil Sandburg. She settled on placing her palms on either side of its bean-shaped torso to gently steer its progress away from its parade and toward her. The degree of pressure she needed in order to influence its course was so negligible she might have been manipulating a balloon, or a toy boat. The Catarkhan meekly turned away from its fellows, moved toward Cort, then stopped, either paralyzed by its unexpected detour, or confident that she would soon provide it additional guidance.

The Catarkhans who had been marching along behind the one she'd captured did not follow. They ignored the disruption and continued their march without interruption. As far as Cort could tell, there was no way of telling whether this was obliviousness, deliberate judgement, or robotlike devotion to their previous programming.

The one she had pulled from its place on line just stood there, waiting. It didn't see her at all. She wasn't there. She may have been an incomprehensible natural force capable of producing changes in its daily routine, but she was still as invisible as a spirit.

"Or a Demon," she said, thinking of Emil Sandburg.

Whalekiller said, "What?"

"Nothing."

The cilia around the Catarkhan's wide-open mouth writhed like anemones. The only indication that it was trying to perceive anything other than itself, they too looked deaf and blind—aware that something was happening, but forever unable to determine exactly what. Cort tried and failed to discern patterns in the way they danced. "Can I touch those?"

"For all the good it will do," Whalekiller said.

Cort was wearing the gloves she usually wore for planet work; the risk of getting dirt, real planetary dirt, on her fingers was just one of the many things she didn't appreciate about worlds. She doffed the right one and touched those undulating little worms with the tip of her index finger. They weren't slimy, as expected; they had a sandpapery, feverish warmth that didn't feel organic at all, but more like some kind of fabric that had been stored under hot conditions. They didn't react to her touch at all, and neither did their host.

She glanced at Whalekiller. "Nothing?"

"It doesn't have taste receptors for anything you're made of," Whalekiller said.

"So I'm still invisible to it."

"That's right. It can't sense you at all."

"Doesn't it have any idea what's happening?"

"To know how much it understands, we first have to get into its head, and to date, nobody, not even the Riirgaans, has ever succeeded in doing that."

Cort's grimace grew broader. "Then how the hell do we know it's sentient?"

"The same way we know the Vlhani



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or the Thlane or the Farsh are sentient."

They were three pretechnological species who had presented particularly tough first-contact problems. They were all clearly sentient, but they were all so alien, not only by the standards of human beings but also by the standards of all the other known spacefaring species, that the task of establishing some form of substantive communication with them had been dragging on for years. But the comparison was not perfect, because while little communication with the Vlhani and the Thlane and the Farsh had progressed beyond the equivalent of baby talk, all three species had at least noticed that somebody was trying to talk to them. The Vlhani had even progressed to the point of allowing human beings to participate in their most sacred rituals—and in raising holy hell when the idiot human ambassador tried to interfere. But seven Earth standard years of constant study had left the Catarkhans still cut off, disconnected, oblivious.

She said: "How do we know? Wishful thinking?"

If Whalekiller was offended by her sarcasm, he did not show it; instead, he launched into a speech so polished that he must have honed it during many previous briefings. "By measuring the data content of their interpersonal communication."

"There is some?"

"It all takes place in the hive. There's an incredibly complex language that has to do with how many cilia they touch or refrain from touching at any one time—I don't get most of it myself, but the Riirgaans, who made the breakthrough, mapped the informational traffic, and found grammatical structure, consistent themes, individuality, complex repeated sequences, and even regional accents. It's as dense as an AI stream. It's definitely sentient communication. But nothing in it seems affected by anything they do in their daily lives—it feels as abstract as philosophy or religion or poetry, and it's totally inaccessible to us without some kind of clear way in."

"I don't know, Whalekiller. Sentience implies a certain minimal level of free will, and I don't see any of that in their behavior."

"They have plenty of free will—as far as talking to each other is concerned. They just don't need any to handle their behavior. Their behavior is hardwired."

"Instinct," she said. "Or reflex."

"Something like that. See, Counselor, Catarkhus has such a stable ecosystem it's ridiculous. They don't have any predators. They don't have any enemies. They don't have any seismic activity. They don't have any heavy weather. They only have a limited number of contagious diseases. They never needed the capability to react to unforeseen circumstances. They never needed a wide array of senses to provide constant data about an unstable and potentially dangerous environment. They never needed pain to teach them which things were bad to do. And they never needed individual variation to provide their population with complementary and competitive skills. They just needed food-gathering and reproductive instincts, and primitive tactile and olfactory senses to help them out on those rare occasions where that wouldn't be enough. They didn't need brains this evolved, or a communication system this complex. That's all devoted to higher thinking. In fact," he added, as if just remembering it at right that very moment, "there's a school of thought, among many of the exolinguists here, that says the Catarkhan mind isn't really aware of what the body does at all—that the intelligence they possess is totally disconnected from a daily life run by their involuntary nervous system. It would explain a lot. But either way, their adaptations made them totally helpless when something genuinely alien did enter their environment."

"Ourselves," Cort said.

"Well," Whalekiller shrugged, "the



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Bursteeni first. They discovered the species and named the planet. Then the Riirgaans, who established Catarkhan sentience. Then a couple of others, and then us. We were the last to join this particular contact mission. But we're all alien here . . . and we're all new concepts to a creature biologically incapable of perceiving new concepts."

Nodding, dazzled by the size of it, Cort murmured: "We're nonhappenings. Rumors."

"Not even rumors," Whalekiller said. "Invisible demons."

There was that word again. It applied uncannily well to Emil Sandburg. The Catarkhans he'd torn apart hadn't known that anything was happening to them; they hadn't suffered in pain, or in terror, or in sheer rage that the Universe would select them for such torments. The ones he'd left behind, the ones he hadn't had time to touch, probably didn't even know that any of their number were missing. For them, the crimes of Emil Sandburg had been nonevents in an existence so unchanging that even ten thousand generations would not provide one sentence of actual history.

It hadn't touched them at all.

"What?" Whalekiller asked.

"Did I say something?" Cort said.

"No. But you're smiling."

"No, I'm not."

"Believe me, you are," Whalekiller said. "It's the first time I've seen you do that since I ferried you down from orbit."

That surprised her. She so rarely smiled. But now that it had been pointed out to her, she could feel the telltale tension in her cheeks. She fought down the feeling, buried it, and drove a stake through its heart. "Come on. We still have a lot to do."

7.

They caught up with the Riirgaan witness, one Goodsir Vighinis Mukh'thav, at their own embassy compound on the edges of a Catarkhan temperate rainforest. Like most of the other embassies, it was a site far removed from the habitat of the indigenous sentient species; it was a standing policy instituted to avoid contaminating the culture of the locals with excessive exposure to offworld technology, but the truth was that the Riirgaans might have picked it anyway. They just enjoyed environments like that, for some reason beyond Cort's comprehension; though their own world wasn't anything at all like that, and they seemed far too intelligent to enjoy nasty things like bugs and venomous plants and mud under their feet all the time, they considered the hothouse jungle a paradise. They even liked swimming, which had always struck Cort as, war excepted, the most insane habit that any sentient race had ever cultivated for itself; after all, people drowned in water. It's a planet thing, she supposed. And as a species that seemed to enjoy ferreting out and establishing contact with the most unlikely alien sentients imaginable, they would have had to harbor a fair degree of tolerance for planet things.

Mukh'thav was, according to Whalekiller, what the Riirgaans call a First-Contact Prime, a position which should have kept him out in the field living as close to the natives as possible. But now they had him assigned to full-time vehicle maintenance, a job that kept him securely within their embassy perimeter. He explained why as the three of them sat together at an outdoor table the Riirgaans had carved into one of the ornate historical friezes that decorated so much of their artifacts, Cort and Whalekiller drinking the hot coffee the Riirgaans had been kind enough to provide, Mukh'thav lowering his flat, mask-like features to inhale the vapors from some kind of fermented mush that bubbled and roiled in a bowl set before him. "I am polluted," Mukh'thav said, with a sadness that broke through the infamous Riirgaan reserve. "I have seen an atrocity, and I still feel the filth on my



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skin. I am here, performing menial labor instead of the work I trained for, because I do not know if I will ever feel clean again."

"You were not responsible," Whalekiller said.

Mukh'thav cocked his head in the unreadable Riirgaan manner that could have been any emotion from annoyance to affection to distaste to warmth. "Do you expect me to take comfort in that? Is that the way you Hom.Saps think? That if a terrible crime occurs when you are not present to stop it, you are not at heart responsible? It is no wonder you have historically always been able to live in comfort and complacency when others of your people conducted genocides in other parts of your habitat. My people find such detachment profoundly alien. But I suppose that, given your tendencies, many of you cultivate the knack in order to remain sane."

Cort's voice was very tight and very controlled. "I'm not detached from this, Mr. Mukh'thav."

The Riirgaan made the kind of noise that seemed to concede the point while simultaneously establishing that nothing had been conceded at all. "Forgive me, Andreacort: I am sure you believe that. But you are also a bureaucrat, well-used to professing deep personal compassion as a matter of policy. It is still not real to you."

"Real enough to feel polluted; to still feel the filth on my skin; to know that I'll never feel clean again. Think what you want of us in general, Goodsir, but I am not detached."

What followed was a noticeable pause, as Riirgaan and Human faced each other, like a pair of imperfect reflections recognizing the face on the other side of the glass.

It was not telepathy; neither individual was wired for it. But some knowledge is so shattering that people who share it can recognize each other. In Cort's case it took the form of a night filled with screams. In Mukh'thav's, it was the sight of Emil Sandburg plying his deadly hobby. They were different lessons, learned in different places—but while the particulars were different, the resonances were still great enough to fill the air between them.

Whalekiller, abandoned somewhere outside the loop, glanced from one impassive face to the other, saw the moment of clear understanding that passed between them—and seemed terribly frustrated by his own inability to partake of it. He hesitated only a second or two longer before breaking the silence: "None of us approve of what Sandburg did, Goodsir. We all want justice."

Mukh'thav turned toward him, as if reminded of his presence. "Yes. Justice." He slumped. "As if that's even possible in this case."

"I intend to make it possible," Cort said.

"I did not expect to believe you, Andreacort, but I suppose I do, now. Will you require me to describe what I saw?"

Cort held off responding long enough to take another sip of coffee and set it down on the mat the Riirgaans had provided to protect their intricately carved wood. "No particular need for that; your testimony has been recorded, and the crime itself has already been established to our satisfaction. Sandburg himself admits it. What hasn't been established, at least in my mind, is just what the crime was."

There was a moment of silence. The impassive, inexpressive Riirgaan face, locked as it was in one blank mask, nevertheless seemed to change aspect four times in the interval before Mukh'thav's answer. "You know very well it was murder."

"I do," Cort said, keeping her face as unreadable as Mukh'thav's own. "I am wondering whether you believe it was also torture."

Mukh'thav's considered that for what seemed a small eternity before raising his face out of the thickest vapors, leaning back, and linking hands in a gesture



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so deliberate that the fingers seemed to knit in slow motion. "It is an interesting question, Andreacort. Is it also an important one?"

"I'm just collecting data," said Cort.

"Very well, then." Mukh'thav's head cocked again; this time, she experienced no difficulty interpreting the reaction as the expansiveness of an expert enjoying the opportunity to show off his knowledge. "The victim was a Catarkhan. It wasn't capable of being tortured. It wasn't in pain. It wasn't afraid. It wasn't even aware. It was a creature being violated that had no sense of violation; a being ripped apart which wasn't equipped with the senses it needed to understand what being ripped apart meant; a conscious, thinking creature that couldn't hear its executioner's laughter. Death, when it came, wasn't a blessing or a surprise; if the Catarkhans have an afterlife, they may not even notice the passage." He lowered his head to the vaporous bowl one more time; when he raised his head, bits of smoke roiled around his carapace, making him resemble a demon who had just emerged from one of the hotter pits in hell. "If it is your Hom.Sap. intention to argue that this small mercy somehow diminishes the crime . . ."

"Not at all, Goodsir." She picked up the coffee cup again, emptied it to the dregs, and placed it down again, before rising and gesturing for Whalekiller to do the same. "I'm just establishing what the crime really is. And what it is not."

Whalekiller was about to suffer a hernia withholding his curiosity.

Mukh'thav's face roiled with vapors. "You are done?"

"Not even close," said Cort.

**8.**

The Tchi embassy was a snow-white pylon stabbing the sky from somewhere in the most inhospitable wastelands of the Catarkhan polar region; it was the very vessel which had brought them here, imbedded in ice, facing the sky as if it never expected to see the stars again. The minimal living space within the vessel itself was supplemented by about a dozen small inflatable structures that sprouted from the surrounding glacier like mushrooms, and one big transparent dome that rested on the pylon's flat summit. The dome, which turned out to be one of their bubblewall inflatables, was as warm as toast, comfortably furnished, perfumed with a fertilizer scent Cort assumed to be an import from the Tchi homeworld, and wholly insulated from the constant assault by the most hostile landscape Catarkhus had to offer. The Tchi did everything they could to see to the physical well-being of their guests Whalekiller and Cort, bringing refreshments, inquiring after their comfort, and even altering the humidity level on request—but Cort was still miserable there; every time a gust of wind lashed the bubblewalls with snow, she gripped her couch reflexively, certain that their precariously balanced platform was about to break off and spiral away into the distance.

Really, she didn't understand anybody who liked planets one bit.

They were there for about one hour, waiting, before Whalekiller, who had been pretending to be engrossed in the view, broke away with an explosion of hoarded breath. "Counselor . . . I know I'm supposed to give you room to work, here . . . but just what the hell was going on, there, between you and Mukh'thav?"

Cort avoided his eyes. "Nothing unexpected, Bondsman. Just evidence-gathering, nothing more."

"I don't mean your line of questioning," he said. "I'm sure you have something in mind. I mean that moment earlier on, when you took all his contempt for us and flung it back in his face. He saw something in you that I didn't. What was it?"

She gave him a look. "Empathy."

The muscles in his face twitched. "I'm going to figure you out sooner or later."


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"Let me know when you manage it," she said.

After a moment, he nodded and returned to the edge of the bubblewall, where he could lose himself in the ice-fields of the Catarkhan north.

Cort was grateful to be left alone, if only for a few minutes, but genuine peace eluded her; the second she permitted her mind to drift, it came across the image of Emil Sandburg, slicing away at a Catarkhan victim. Her mind refused to reconstruct what Emil had done—if only because she still didn't know what a Catarkhan looked like beneath its skin—but it showed real enthusiasm imagining the face he'd worn during the act. Possibilities paraded themselves before her: the dispassionate killer, the gleeful killer, the leering killer, the orgasmic killer, the killer who didn't seem to know what he was doing. None of them made any immediate sense. By the time she gave him a face filled with fear, she realized that the image in her mind was not Sandburg's face at all . . . and that the Catarkhans she imagined were not the funnel-faced hive-creatures Whalekiller had shown her. No, these were more humanoid. They were mammalian, they were humanoid enough to possess human expressions, they had bright green eyes filled with humor and curiosity, and their screams were resonant baritone rumbles, backed by a chorus of more human cries.

She opened her eyes and discovered that Whalekiller, still standing against a backdrop of frozen wasteland, was now staring at her with frank concern.

She blanked her expression and stared back until he looked away.

It was an eternity before Haat Vayl, the Tchi exolinguist they'd come to see, arrived for the interview. Thin even by the slight standard of his species, an attribute which might have been a measure of advanced age, Vayl was also marked by an air of deliberate gravity and a set of forlorn, droopy eyes that together made him resemble the most unctuous bureaucrat ever to take secret pleasure in giving bad news. He wore a long diaphanous robe so delicate that it seemed about to tear with every step he took.

Unfortunately, Counselor Rhaig, the Tchi who had accosted Cort earlier, was with him, and considering himself in charge. His pale skin reddened from wind-burn, his fringe of curly gray hair frizzed with moisture, he nevertheless bustled across the chamber with an easy grace that left his more feeble colleague Vayl far behind. "Forgive us the delay, Counselor—but I was out in the field, observing the indigenes."

"You didn't have to cut your observations short for us," Cort said. "We were here to see Dr. Vayl."

"I'm aware of that," Rhaig said, as he claimed a seat opposite her, "but the doctor here thought it wise not to speak with you unless I was personally here to advise him on his answers."

Cort would have bet a considerable sum that the policy was not Haat Vayl's personal idea. "That isn't necessary, Counselor. The doctor isn't a defendant in danger of incriminating himself."

"He most certainly is not," Rhaig said, "but since humans are universally recognized as masters at the art of the malleable misquote, he did consider it prudent to have an advisor at hand."

Overstepping his bounds, Whalekiller said: "You really do go out of your way to be unpleasant, don't you? What kind of distortion could you possibly be afraid of, here?"

Rhaig fixed him with a cool glare. "If I truly wanted to be unpleasant toward you, Mr. Whalekiller, I would make obvious remarks about the irony inherent in your having a name that so aptly commemorates one of your species' most infamous past acts of xenocide. But my determination to treat you with basic civility will not prevent me from doing everything I can to counter the human tendency toward gross revisionism."

Whalekiller collapsed into the chair



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beside Cort. "You'll notice he didn't answer the question."

Cort, who had indeed noticed, addressed Rhaig: "Do you have a personal problem with human beings, Counselor?"

"It is not a personal problem at all. I have dealt with several tolerable members of your species. The best of you seem to mean well, even if your inborn inadequacies prevent you from accomplishing it. Alas, the best of you constitute only a small percentage of your population—and the collected mass of you refuses all responsibility for the acts of the worst. I think that makes you dangerous. I think it makes you something that should be contained."

"Like a disease," Whalekiller said.

"Precisely," said Rhaig. "There's nothing wrong with human beings that a good military quarantine couldn't cure."

Cort's own dislike of the Tchi counselor was so intense she almost wanted the argument to run its course, but her time here was limited, and she had another agenda to pursue. So she addressed her next words to the weary, silently-waiting exolinguist who had just taken a seat at Rhaig's side. "Goodsir. Forgive us. You are a scientist caught in an argument between bureaucrats."

"I've noticed this." Vayl said, in the craggy, desert-wind tones of any human old man. He was frail, all right; the very effort of speech seemed to diminish him.

"My name is Andrea Cort; I'm here to help determine the issue of jurisdiction in the Emil Sandburg case. What I need from you, as the ranking researcher here, is your perspective on the Catarkhans. You do agree with the accepted judgement, that the Catarkhans are sentient?"

Vayl's voice was a rasp that barely traveled the short distance to Cort's ears. "I do."

"A very learned human once defined sentients as creatures capable of unpredictable behavior."

Rhaig cut in: "I will not allow you to use a human definition for the sake of human convenience."

Vayl lowered his head. "I will accept it for the sake of discussion, Counselor. Continue."

Cort resisted the temptation to stick out her tongue at Rhaig. "Once, a long, long time ago, I had a puppy who met that standard. That's a small domesticated animal some human beings have as pets; they're pretty rambunctious and hard to control when they're young. There is never any way to predict what they're going to do, and they do show a fair degree of skill at problem-solving, in things that matter to them—issues such as, let's say, getting into a cabinet filled with food, or evading capture when it's time to put them back in their pens. Puppies pass the unpredictable-behavior test, but nobody would ever declare them sentient."

Rhaig, who had been rolling his eyes throughout, now heaved a heavy sigh. "Is this another example of the way human beings think? Demeaning murder victims by comparing them to domestic animals?"

"No," Vayl said, silencing the Tchi counselor with a gesture. "I'll answer that." A tiny pink tongue emerged from his beaklike lips, performed a full circuit of his mouth, and then retreated. He addressed Cort: "I can see where you're going with this, Counselor, but this test of yours provides a very unreliable means of measurement. Certainly, there are high-ranking officials among both our peoples who would never pass it—hidebound personalities whose responses are fixed in stone by their prejudices but who yet remain sentient by every measurable standard." He made a point of glancing at Rhaig, who blinked several times before Vayl continued: "The same is true for the Catarkhans, but only more so. Their regimented existence may provide them with a limited range of responses we can understand, but every single analysis done so far estab-



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lishes that they have a wide range of responses when communicating with each other."

"You are absolutely certain of that?" Cort asked.

"Yes, I am. But whether we will ever be able to establish any form of communication with them, or how you're going to provide them the means to prosecute your murderer, remains to be seen."

"Thank you," Cort said. She lowered her gaze to the floor, took a deep breath, and continued: "I have one more question."

"Perhaps a relevant one this time," Rhaig suggested.

She ignored him. "Assume for the sake of argument that your own people had never experienced any previous contact with human beings. Assume that we hadn't agreed on a common diplomatic language, assume that you knew nothing of us except that we had been judged sentient by somebody whose expertise you trusted. Assume that we were now meeting for the first time. Assume I now marched in, crossed the room, and without any previous provocation punched Mr. Rhaig here in the mouth." (Rhaig's head rose a little higher on his neck at that one.) "Eliminating all interspecies chauvinism, would that gesture communicate to Mr. Rhaig the message that I don't like him?"

Dr. Vayl's eyes narrowed enough to suggest that he was either deeply offended or deeply enthralled by the image; his sudden animation seemed to suggest the latter. "I would be inclined to believe so, myself, but bereft of data, I would also have to admit the possibility that human beings always said hello to other sentients that way."

"Too often they have," Rhaig said.

Whalekiller, giving the devil his due, actually chuckled at that.

Cort only had eyes for Dr. Vayl. "All right, then. Forget meaning. Would it qualify as any kind of message at all?"

Vayl's eyes were almost closed, now. "I would have to say so."

Whalekiller—whose own enjoyment of the turn the conversation had taken had lit up his face like sunrise—seemed almost giddy.

"So what you're saying is: Inflicting pain qualifies as communication."

"Not in any articulate manner, of course—but yes, I would have to say so. In fact, at the bare minimum, pain is the body's message to itself. Unfortunately, I don't see how that's relevant here; as I'm sure you've been told by now, the Catarkhans—"

"—don't feel pain. I know." Cort stood, bowed, and signaled the still-goggling Whalekiller that the interview was over. "Thank you very much, Goodsir Vayl, Goodsir Rhaig; I have all I need for now."

## 9.

That night, back at the embassy, Cort sat on the edge of her bed, which was the only item of furniture in the small cubicle she had been provided. It was her second set of quarters; the first had been the local equivalent of VIP accommodations, tiny by the standards of some official residences where she'd stayed but downright palatial in light of the limited resources available to most first-contact embassies. There was room to pace, a desk, a soft chair, a dry-flotation mattress on the bed, a sleep inducer, full sonics in the bath, and a full-sensory hytex link. She would have been absurdly comfortable there; the inducer alone would have ensured the kind of dreamless full night's sleep that she rarely achieved in a lifetime of nights too often interrupted by bad dreams and cold sweats. But she had wanted a smaller room with fewer amenities, and had successfully fought Ambassador Lowrey's protests to the effect that an important visitor like her clearly deserved the best.

These second quarters were even smaller than the medical isolation cell provided to Emil Sandburg—the only item of furniture was a bed that folded



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up into the wall, and the only amenity was a sonic shower tucked away in one corner. The idea of pacing, in that small amount of floor space that remained, was a joke; any observer would have thought she was merely spinning in circles. It was very much like being in prison, which was precisely what Cort liked most about it. Let other VIPs have rooms large enough to get lost in. Cort didn't approve of rooms she could get lost in any more than she approved of planets. Quarters this small reduced everything to its bare minimum: herself, and her task. As far as she was concerned, there was nothing more. Everything else was static, and an invitation to unwanted dreams.

She'd rejected an invitation to dinner with Lowrey and the rest of his command staff, eating in the room as she pored over the life story of Emil Sandburg. It was, strictly speaking, irrelevant to the case she was putting together—interspecies law didn't allow for sympathy based on cruel childhoods—but it provided an interesting picture. Or rather, the lack of one.

His parents were nonentities, zeroes in political affiliation, religious background, and lateral economic movement. He had gone through thirteen years of schooling without distinguishing himself in the locally mandated intelligence tests, personality profiles, socialization ratings and emotional intelligence scores. None of the tests had indicated either antisocial activity or any kind of personality at all. His Dip. Corps psych evaluation described him as dull and humorless but worth signing because of a compensatory drive to succeed; it was even noted that he wouldn't be popular among his fellow indentures but wouldn't be a noticeable irritant either. (It was, she noted with grim humor, pretty much what the same required evaluation had said about her.) There had been no sign of murderous tendencies or the arrogance he had shown in his meeting with Cort. Maybe he'd been repressing his true personality. Or maybe the personality he showed now was the put-on. . . ? Maybe he enjoyed being a monster?

It was not a point of view she could share; being a monster had blighted her life. But then her monstrousness had come early, reducing everything she'd done since to expiation. Sandburg's monstrousness—or at least, the discovery of it—had come late, as if it was something he'd needed to work hard to achieve. Maybe he saw it as an accomplishment, something to be proud of. . . ?

Something resonated there. She flagged the question for later perusal.

From there she moved on to historical and legal precedent, examining the stories of historical crimes against natives on a flatview image projected against the plain white wall. She went back centuries, back to the old single-system days, even back to the single-planet days, and was depressed by just how many there were, though there were of course many more in the days when the confederacy was still trying to be a colonial power, and understanding the aboriginals was not nearly as great a priority as making sure they were subjugated. It was such a litany of human madness that it made even Cort, who was already familiar with much of it, nauseated at the sheer waste.

Habit, and masochism, led her to call up the well-worn story about the massacres at Bocai. It was an old tale, and one she knew by heart; she didn't need to read the file. But she did spend some time examining the one image known to have survived the event: a stillshot of the ragged survivors being loaded into a rescue shuttle. It was not the best neurec image of all time: a poor signal had blurred the captured memory and turned the finer details into mush. But even so, it was easy to tell that the survivors were traumatized to the edge of sanity; their faces looked vacant, uncomprehending. One, a little girl who stood alone by the edge of the frame,


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staring at nothing in particular, had pale eyes old enough to have witnessed the shattering of worlds.

*Don't trust anything sentient*, she thought.

Then the hytex image scrambled with a voice message that the ambassador needed to see her in his office immediately.

She found him dressed for bed and pacing in circles like a man who believed the floor to be mined and who was so irritated at the inconvenience that he was trying to set one off just for spite. He had worked himself into some kind of serious frenzy; his forehead was a spotlight, and his hair an explosion of greasy thickets. Whalekiller, who must have caught some of the shrapnel already, stood just outside Lowrey's orbit, studying the floor so intently that he might have subscribed to the mine theory himself.

The ambassador stopped in midcircle the instant he saw Cort. He glared at her, his eyes round, his face the color of blood. "Counselor. I was assured that you were good at your job. I was told that you were a professional."

Cort answered with perfect calm. "I am."

"I just spent the last three-quarters of an hour calming the Tchi ambassador. He says you threatened violence against their man Rhaig. Is it typical Tchi bullshit or is he telling the truth?"

"He might think he is," Cort said.

That broadsided Lowrey; clearly, he'd expected a flat denial. He approached and faced her from less than a meter away. "And just what the hell is that supposed to mean?"

"It means that since their ambassador wasn't personally present when we met with Rhaig, he only knows what Rhaig told him. He might not be a part of the lie."

Lowrey studied her eyes as if expecting the answer to scroll across them in readable type. "Rhaig says you threatened to punch him."

"I did not. I just presented a hypothetical first-contact situation that included me punching him in the face. I never said that I intended to do it, or even that I wanted to. I just used it to set up my question for Dr. Vayl."

Lowrey's cheeks twitched. "Rhaig says that you were trying to intimidate him into ceasing his support of the Catarkhans."

"Rhaig has yet to accomplish one damn thing for the Catarkhans. And he was sitting next to another member of the Tchi delegation who had absolutely no trouble understanding the difference between a hypothetical question and a genuine threat."

Lowrey's anger was fading, now; but like most people who have felt anger slipping away, he used the tools he had to try to prevent it from leaving. "He says Dr. Vayl will testify for him."

Cort met his look with a far steadier one. "I'm not fond of the Tchi. But unless I hear that from Dr. Vayl himself, who I would consider a reliable witness, I would have to consider the Counselor a bigot, a paranoid, and a liar."

The ambassador absorbed that, then gave a barely perceptible nod and retreated to the safety of his desk, collapsing in his seat with the suddenness of a man yanked down by invisible strings. "Shit," he said, patting the desktop. "Shit. Shit. Shit." And then, several seconds afterward: "Shit." The bluster of a few seconds earlier was completely gone now, replaced with a weariness so palpable it seemed to be what he had instead of blood. His features sagged, and his eyes aged about ten thousand years, and he said, "Do you know why the Dip. Corps assigned me to this place, Counselor? Not because I'm good at first-contact; I'm not. I never have been. They gave me this job because seniority demanded it. They figured I couldn't mess things up too badly on a planet of beings blind, deaf, and dumb. Nobody saw how I could possibly manage a diplomatic incident out of that. Nobody



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ever thought that anything on this rock could possibly be that important." He sighed. "But one thing even I know is that if you don't know how alien cultures think, you run the risk of making matters worse."

Cort moved to one of the chairs and sat down. "With all due respect, sir, I've spent my career arbitrating legal disputes with alien cultures. And I strongly suspect this particular misinterpretation has less to do with Counselor Rhaig being a Tchi than it does with Counselor Rhaig being a flaming asshole."

Forgotten in his corner of the room, Whalekiller tried very hard to stifle a laugh.

Lowrey, shooting him a look, and trying equally hard to remain stern when his own ability to maintain a straight face hung by a thread, said: "He's going to hurt us for this, Counselor. He's going to demand sanctions."

"Not a loss, sir. He was going to try to do that anyway. He had it planned when he got here. It's his agenda. He practically admitted as much—he's thrown in with those who want us censured and crippled by a total diplomatic quarantine. Unless I'm wrong, he really believes he can use this situation to cut us off from all influence in matters of interspecies policy."

Lowrey blanched. "And can he?"

"Of course not. It's a fringe-group opinion; he doesn't have nearly enough influence, even among his own people, to push through what would essentially be an act of war. He can only use our failure here—if we fail—to build some additional support for his cause. And I won't let him, because I have no intention of failing. I'm going to make justice happen here, whether the Catarkhans are capable of providing it or not."

Lowrey almost looked afraid, now; he wore the same paralyzed-rabbit expression that his indentures had shown during this morning's briefing. "I think you're taking bigger risks than you realize. He's got more influence than you think."

"Then it's twice as important to settle this. And I intend to."

The ambassador sighed, linked his fingertips, and examined her like a man who had just boarded a ride he couldn't leave. "How?"

She turned toward Whalekiller. "Something you said earlier—about the Catarkhans not having many contagious diseases."

"That's right. They're very simple organisms, on a cellular level. They—"

"I don't need that much detail. It just occurs to me that saying they don't have many contagious diseases is another way of saying that they do have some."

Whalekiller immediately looked wary. "And?"

"Any fatal ones?"

"We've cataloged a few. Why?"

"I want to see what Catarkhans do when they're dying."

**10.**

The void the skimmer traveled was not the vacuum of space, but it could have been. It was night on a world without artificial light, a condition that rendered the landscape below them effectively invisible; it was a stabilized vehicle so unbuffeted by local weather conditions she could pretend she wasn't moving at all; it was filled with air so filtered that even her hypersensitive nose couldn't discern any of the annoying local smells. Cort found that comforting, in a way: but for the trace level of unease she always felt in the presence of other sentients, it was pleasantly like being safe in an egg. It was amazing, she thought, just how much the absence of anything involving planets or other people improved the general ambience of things.

Whalekiller naturally did his best to disrupt that ambience, banging around an equipment locker in the rear of the skimmer as if all human civilization depended on his ability to make percussion noises with every tool in his inventory. Worse, he insisted on chatting: "I


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know it's night here, but we're going to make things easy on ourselves. We're going to hop hemispheres, pick a hive someplace where it's midday."

"Fine," said Cort.

"It really doesn't matter one way or the other, of course. There's no natural light underground; wherever we go, we'll still have to carry in helmet lights. But most people exploring downside feel more comfortable knowing that there's still a sun burning somewhere up above." More clanking and clanging; a muffled curse. "I don't know why that is. Psychological, I suppose."

"Fine," Cort said again.

Whalekiller backed out on his hands and knees. Then he sealed the locker, stood, arched his back in a manner that suggested a dedicated project to realign each and every vertebra, then collapsed into the seat beside Cort. Collapsed was the precise word; he didn't so much lower himself into the chair as permit gravity to pull him there. His weariness showed in the dark circles lining his eyes. "Of course, waiting 'til tomorrow would have been good, too."

"Sorry. I figured we were up anyway. Might as well get the job done."

"Up and exhausted, and the job could have waited. Or don't you ever sleep?"

"As little as possible," Cort said.

He raised an eyebrow. "Bad dreams?"

"Better things to do."

He accepted that, and pretended to consult the display, which was now projecting a miniature topographical map of the dark regions passing by far below. With the course laid in, the map was at best a formality, designed to provide a pilot the illusion of having something to do with actually controlling the vehicle; it was rendered even more irrelevant by the exaggerated vertical scale, a sop to clarity that turned even the gentlest foothills into jagged Himalayan spires. As a navigation resource, it was next to useless; as reassurance that the vehicle remained in charge, it was invaluable. But Whalekiller's expression as he regarded it seemed lost in more ways than one . . . and more tired than mere physical weariness could have accounted for.

He didn't look at her when he said it. "Bocai, right?"

A lump of molten lead, composed of equal parts anger, embarrassment, shame, and fear, materialized all at once in the center of her chest. She wanted to kill him. "You've been investigating me."

He still wouldn't face her, so deeply engaged in the navigation display that it might have been offering him a life-sized landscape in which to hide. "It didn't take much, Counselor. I didn't have to read anything classified. It's all in your Dip. Corps profile—maybe a couple of levels deeper than most searches would penetrate, but nevertheless available for any sufficiently interested person to find."

Cort didn't buy that; she'd been through every line and every link in her profile, and she knew just how deeply the Bocai material was buried. A casual search wouldn't have turned it up; Whalekiller would have had to conduct genuine in-depth research. Her voice dropped about forty degrees as she said: "Nobody invited you to be interested."

Whalekiller's eyes flickered toward her. "I know, but I'm an exopsychologist. Poking my nose into alien minds is what I do."

Cort felt more violated with every word he spoke. "I'm not an alien, Bondsman. And I'm not a mystery put here for you to solve."

He looked at her, and though his own eyes were as dry as hers, the sadness she saw there seemed, like hers, far too great to have accumulated in only one lifetime. "Everybody's an alien, Counselor. And everybody's a mystery. We weren't necessarily put here to understand—but we were sure as hell put here to try." He let that hang for a heartbeat, as if believing that it might be enough—then apparently saw that it wasn't, and shrugged, providing the ultimate inexpressive gesture for the ulti-



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mate inexpressive moment. He regarded the nav display again, and said: "It makes no sense. Two small communities. One human, one indigenous sentient. Living together, in a remote region of the indigenes' homeworld, in what seems like perfect harmony for twenty years OES. The two species trading, communicating, participating in each others' festivals, so psychologically compatible that they fool themselves into believing they're also psychologically identical. So pleased with how they get along that two families, acting with the approval of their respective leaders, experiment with raising each others' young. And then, with no warning—" He shook his head. "Do you even remember what set it off? What would make both sides go after each other with such hatred? And why would—"

She cut him off with the most acidic voice she could muster. "I've answered these questions before, Bondsman."

But Whalekiller remained unfazed. "You've said you don't remember. From what I could see, none of the other survivors did, either. Oh, they told plenty of horror stories about what the Bocai did to the humans, and what the humans did to the Bocai . . . but nobody's ever said word one about what started the killing. Nobody's even come up with a workable theory. All I can tell is that one little girl with one foot in both worlds walked away saying she hated humans and Bocai both. That she would never trust sentients again." He looked away from the navscreen, and bored his eyes into hers. "It's what you said to me. You're a bigger mystery than Sandburg, you know that?"

"I was eight years old," she said, hating the defensiveness that always came over her whenever she was questioned about that hated summer. "It was a long time ago."

"No, it wasn't. I just have to look at you to know it's still happening."

Cort wanted to rip the prying son of a bitch a new asshole, but for the life of her she couldn't think of anything to say.

He astonished her with what he said next: "You'd be surprised how much we have in common . . ."

**11.**

The hive Whalekiller had selected ("Calcutta," he said), was nestled in a chain of remote rust-colored hills somewhere in the temperate band of Catarkh's southern hemisphere. It occupied pebbly ground that crunched with every step they took—the kind of terrain that would have rendered stealth impossible on any world where the deafness of the natives wouldn't have rendered stealth irrelevant. The vegetation was so sparse and scrubby it seemed to have established a toehold here out of obstinacy alone. The main entrance to the Catarkhan hive was a spiral funnel, sinking diagonally into the earth. There were a handful of Catarkhan footprints near the entrance, but otherwise no sign that anything lived below.

Cort hesitated when, taking her first step into the tunnel, she sank up to her ankles into soft sand, considerably more yielding than the desert terrain she had just left. She was not yet ready to forgive Whalekiller enough to speak to him, but necessity obliged her: "Just how stable is this place?"

Whalekiller saw she was about to stumble, and steadied her with a tug on her upper arm. "Very stable, Counselor. The walls aren't made of this stuff, fortunately; they would collapse in a second if they were. This is just flooring the Catarkhans carry from a sand quarry about seven klicks away. The walls themselves come from some tougher kind of gravel the locals gather somewhere else; they do something biological to it that makes it liquefy into a kind of malleable cement. It's an entirely different kind of construction than that used by their cousins in the other hive I showed you—but that was half a world away, where they have a different set of



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raw materials."

She pulled free of Whalekiller, tested her footing with another step, and decided that it seemed safe enough, if a clumsy medium for human feet. Several steps further in, her eyes narrowed: "So their behavior isn't all hardwired, after all."

"Not entirely. They're sentient, after all; they can override instinct when they absolutely have to. But it's not so much creative thinking or the ability to learn as it is a facility for rewriting survival behaviors on a group-by-group basis. For instance, the guys down here don't have any decent farmland, like their cousins up north; they'd starve if they tried to support themselves that way. So they subsist on some kind of foul-smelling yeasty stuff they cultivate in ground water cisterns about half a kilometer straight down. It's nasty, but it sustains life."

"Which shows a certain degree of adaptability," Cort said.

"Within a very narrow range. If you took a bunch of random Catarkhans from this hive and transplanted them to the location I showed you before, most of them would starve to death; a few of them would rewrite their personal software to match the new paradigm, and thrive up there while becoming totally helpless here. None of that equips them to deal with a truly random factor, like a cave-in, an offworld maniac cutting them up for fun, or . . ."

"Jury duty," Cort said.

He nodded. "Yes."

It was, after all, the problem at hand.

They descended deeper into the hive, leaving even the ghost of daylight. Their portable lights provided poor alternative. They were bright enough, but something about the congealed stone burrows openly rejected illumination; the little circles of daylight Whalekiller and Cort carried with them seemed tentative and afraid in this place, as if recognizing how unwelcome they were and unwilling to completely banish the darkest of the shadows. Things didn't get any better when Whalekiller and Cort traveled far enough to encounter their first residents, a parade of Catarkhans who marched along in single file, intent on their robotic errand and oblivious of the two invaders who had just landed in their midst.

"This is as close to the surface as these guys usually get," Whalekiller explained. "No topside farms to tend. They'll go up for building materials, but not for much more than that. I'd call it a cultural difference if I was willing to think culture had anything to do with it."

Cort considered just how often the various diplomats here were reduced to disparaging the limitations of the natives. She didn't blame them; the more she heard about this species, the more she found herself thinking of them as a locked door with no available key.

They descended still further, into realms where the air started to deteriorate. They passed more Catarkhans conducting errands, immobile Catarkhans who seemed to be sleeping, and communicating Catarkhans who knelt funnel-face to funnel-face, linking the cilia on their lower legs. Every pair of communicating Catarkhans she encountered looked like every other pair; she knew she'd been assured how intricate and complex their conversations were, but there was nothing else in the Catarkhan demeanor to provide a context capable of allowing her human eyes to see those conversations as prayers, negotiations, ironic banter, dirty jokes, heated arguments, or any combination of the above. Still, the stiff robotic regimentation she had encountered on the upper levels seemed absent in those encounters; whatever these particular Catarkhans might have been saying, they were in the residential district, and they gave the impression of being at leisure. That might not have been recognizable sentience, but it was a start.

"I call this the Main Boulevard," Whalekiller said. "It's a section common



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to most hives, where they have what passes for their social life."

"When do we find a dying one?" Cort asked.

"It's not all that easy, in most hives. Like I said before, Catarkhans don't seem to get sick much; disease isn't totally unheard of, but they usually just wear out when they get too old."

"And this hive is different?"

"Yep. The stuff these particular folks cook in the cisterns has a tendency to turn septic if allowed to sit too long. They're susceptible to the infections. The death rate here is much higher than anything you'd find elsewhere on-world. As it happens, I've been here a few times and I've seen what they do to the afflicted. Down this way."

Whalekiller led her through another series of tunnels. The Catarkhan traffic, crowded in the busier sections of the hive, here grew sparse, then nonexistent. The air got worse, and they switched to oxygen distillers, with masks worn over nose and mouth. They descended another set of tunnels; a nearly vertical shaft they had to descend on ropes. Cort reeled, wondering just how far the hive extended, and how it endured the weight of all the earth pressing down upon it. But just as she began to doubt that Whalekiller really knew where he was leading her, they came to the place he called the Sick Ward.

**12.**

It was a long, narrow chamber stuffed with a huge writhing sea of Catarkhans giving their all for the right to occupy the same space at the same time. They all wanted to be at the center; they all wanted to be surrounded by all the others. The result was a lot like watching maggots swarm over something recently dead; there were so many of them, in such a constricted space, that they literally swam in a sea of each others' bodies, submerging when they could, emerging when the struggle taking place all around them ejected them from the composite body-mass. Some of those she saw on the surface were clearly dead, but she couldn't keep her eyes off one twitching specimen whose limbs had been broken by the eternal struggle. Constantly hurled free of the fight, he just as constantly struggled back, managing a return to the sick ward only to be flung free once again.

Andrea Cort had seen sentient beings slaughter each other. She had seen people she loved, meaning only to protect her, commit acts that had poisoned the very memory of their faces. She had visited worlds wracked by poverty, and worlds where war and starvation and disease had ripped across entire populations in waves, leaving hollow-eyed survivors whose only deliverance was to stand weak and defenseless against whatever came next. She had hardened her skin in a vain attempt to become unshockable, but she had found that there were always fresh horrors capable of touching the soft spots between the scabs. This was one of them. "What are they doing?"

"Are you all right?"

"No, I'm not. What are they doing?"

"Quarantining themselves. There's almost no infectious disease among the Catarkhans—they seem largely immune to it, and most of the researchers here have never seen any—but what little they do have prompts a quarantine response. Most of the hives we've explored have a special chamber set aside for just that purpose; we don't usually find more than three or four residents. Sometimes they get better, and rejoin the hive; sometimes they die, only to be walled in where they drop."

"But that's not the way it's working here."

"Clearly," Whalekiller said. "No, unfortunately for these fellas, the little food-poisoning problem of theirs activates the quarantining instinct—and they're too ruled by their hardwiring to build larger chambers for increased de-



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mand. They'll keep jamming themselves into this space until they reduce each other to fruit squeezed of its juice."

Cort winced at the phrase. "It's horrible."

"It's the way they are."

She watched a little while longer and wondered whether she should revise her feelings about sentience. True, it offered tremendous capacity for evil and madness; it was the soil which nurtured tragedies like Vlhan and Bocai; but instinct—raw robotic instinct—was potentially even worse. Instinct could never be reasoned with. Worse still was the idea of sentient creatures so chained by instinct that they were incapable of ever making any decisions for themselves. She didn't want to know if the Catarkhans before her now had any idea what they were doing; both possibilities struck her as equally terrible.

"What happens if there's an infected Catarkhan too sick to move?"

"They tend to realize they're sick before they show symptoms. But if they don't come down here on their own, they get dragged or carried."

She found herself focusing on one Catarkhan in particular—an emaciated, bloody thing with only three functioning limbs out of the original six, the others so bloodied and broken that they hung from its torso like flexible ropes. Banished by weakness to the outer edges of the Sick Ward, unable to fight its way deeper into the place where it was obliged to lie down and die, it seemed to be spending most of its passage from this life stumbling, falling over, struggling to stand, attacking the wall of writhing bodies, and then stumbling once again. It was pathetic and it was trapped and it was incapable of giving up, even when another of its limbs snapped, and it fell back, twitching and trembling and gathering up the will for another go.

Surprising herself, Cort bolted from Whalekiller's side, seized the prone Catarkhan by its hindlimbs, and began to drag it away from the riot at the threshold to the Sick Ward. As if in protest, it dug two of its forelimbs into the tunnel floor, clawing deep gouges in the sand as she pulled it farther from the impossible destination its hardwiring demanded. The gesture seemed less reluctance than reflex. Beyond that, the Catarkhan didn't particularly seem to mind; it didn't struggle or grow frantic or slash at her in its eagerness to escape. It just continued trying to crawl forward, with a typical Catarkhan lack of awareness that anything was interfering with its progress.

Whalekiller rushed to her side and grabbed the Catarkhan too. "Please tell me what you think you're doing."

"I'm taking a look," Cort said.

"You don't actually think you can help this guy? Look at him. He's holding on to life like it's just a bad habit he's ready to drop."

"I see that," Cort said. "But hold on to him anyway. I want to figure out something." She passed the Catarkhan's hind legs to Whalekiller, then scrambled around its body to face the hollow, unmoving funnel up front. Even now, after years of dealing with aliens, after a career spent teaching herself that facial expressions were just illusory anthropomorphic structures that couldn't even be considered reliable windows to the soul on human beings, and meant even less when used to judge sentients from elsewhere, she found herself searching that eyeless, noseless, faceless face for how it regarded such a violation. She waved that thought away and grabbed the edges of its funnel-mouth with both hands.

Whalekiller held the Catarkhan in place with no difficulty. "Again, Counselor: what are you doing?"

"Taking a message."

The cilia at the edges of the creature's funnel-mouth were slimy with blood and other bodily excretions, and gritty with sand from the tunnel floor. She thought of human equivalents and



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gagged, but brushed her hands through the little undulating fingers anyway. She circled the funnel-mouth twice, then knelt, grabbed the forelimbs seeking purchase in the sand. and brushed her hands through the limb cilia as well. They were if anything even more moist; when she pulled her hands away, her gloves glistened in the glow of Whalekiller's lamp. So did Whalekiller's.

Then she stood, and stepped out of the way. "I'm done. You can let it go, now."

Whalekiller released the Catarkhan's hindlegs. It hit the ground and immediately began to thrash its broken limbs, struggling with every ounce of strength in its possession to reach the Sick Ward that had expelled it so many times. At its current speed and apparent stamina, it might have managed to get there in an hour or so; Cort was not willing to place any bets about the journey being at all worth the effort. She said, "I really do wish there was something we could do for him. For all of them."

Joining her, Whalekiller said: "You've already been given one impossible job on this planet. You don't really need to try for two."

"It doesn't stop me from wanting it," she said, with sadness so palpable that her voice cracked from the weight of it. "I don't like death."

"I don't either," he said—and the sympathy in his voice, while real, was like a knife cutting into old wounds. "But sometimes, if you've seen enough of it, you stop feeling it. It was like that where I came from. And down here, with the Catarkhans, you get clinical. You stop feeling. There's a—"

"Get me the hell out of here," she said, cutting him off.

He blinked, taken off guard by the return of the iron in her voice. For a moment, he looked like he was going to insist on showering her with his empathy. But then he straightened, nodded, and began the task of leading her out.

But then they were attacked by Catarkhans on their way.

**13.**

Both before and after mankind met its first alien sentients, Hom.Sap. popular culture was filled with scenarios where heroic human protagonists withstood assault by wave after wave of marauding monsters.

All of those scenarios presupposed that the marauding monsters in question would be dangerous in some way.

Cort and Whalekiller were several minutes into this attack before either one of them realized that the Catarkhans were not just blindly blundering into them by accident, but ramming them with deliberate intent. The Catarkhans moved so slowly it was more like an organized jostling than a riot. It caused the two humans no damage whatsoever, and rendered escaping the hive just like struggling through any other large crowd. The greatest hardship Cort and Whalekiller suffered was tempering the force of their own struggle to escape enough to avoid doing the delicate Catarkhans any harm.

Whalekiller said: "I don't believe this. They've noticed us."

Cort had suspected they might. "We can get past them, right?"

"I don't think getting past them's going to be our biggest problem."

A Catarkhan rammed its head into Whalekiller's chest, not inconveniencing him at all. Another grabbed hold of his arm and tugged; he flexed, and easily lifted the feeble creature off the ground. It lost hold and tumbled to the tunnel floor in a scramble of arms of legs, with still more Catarkhans, moving no faster than molasses, already scrambling over its body for another attack. He pressed himself against a tunnel wall and said: "You get it? We're like heroes out of myth in here. As long as the tunnel prevents them from coming after us in numbers, we can knock down hundreds of these guys. The problem's going to be getting past them without harming any.



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Kill one, and we start sharing a cell with Sandburg."

"That would amuse him," Cort said.

"Yeah, well, amusing multiple murderers is not one of my life's greatest ambitions."

They inched along the wall, all but impervious to the assaults of Catarkhans trying to drive them back by the sheer weight of their massed bodies. Slow as they were, the Catarkhans seemed frantic, even desperate, maddened by the need to keep the two humans from leaving; but it might as well have been an attack by origami animals, incapable of wreaking harm despite all the ferocity they could muster. Cort had a memory-flash of the massacres at Bocai, but the thought was a mere reflex, with no real weight behind it. At Bocai, two species of equivalent strength had turned upon each other in spasms of equivalent madness; the war had been like many wars, filled with hundreds of life-or-death dramas where the only real factor in who lived and who died had been who was fast enough to strike the killing blow first. This was something else. This was total war fought by a blind enemy that possessed all the strength of a soft breeze brushing against exposed skin. This was not violence, so much as delusion.

Then one of the Catarkhans, launching itself against Whalekiller, scraped a forelimb against his face. He yowled, shoved it aside, and fell back, clutching at his eyes. "Shit!"

"What happened?"

"Lucky shot—poked my eye. Bastard could have blinded me if it had known what it was doing. Hurts like hell."

"You all right?" Cort shouted.

"Can't see out of the thing, if that's what you mean! Watch your face!"

The Catarkhans swarmed even more thickly now, clogging the tunnel up ahead, forming a wall of their own bodies. There was no question of ever being able to get past them now—not without smashing their fragile forms to pieces. It was still more comical than frightening; Cort couldn't look at the way their funnels craned toward the two humans without picturing an orchestra filled with angry trumpets. She had the crazy thought that if all those musical instruments blared at once, they'd all play a single note with perfect pitch—one so distinguished by its absolute clarity that it would explain everything all the exolinguists assigned to the world had never been able to understand. But the thought died, replaced by another: that if the silent Catarkhans had been able to make any noise at all, they would have been screeching with rage.

These Catarkhans hated them. As intruders.

Or as invisible demons.

She shouted: "Fall back! Get to the Sick Ward!"

"We'll be trapped in there!"

"That's the point! Do it!"

Whalekiller would have argued, but the wall of bodies the Catarkhans had built to prevent him from moving further down the tunnel had transformed from a wall to a tidal wave, breaking down on top of him. It was still like being pelted with creatures made of paper, but he was being buried in them, and their sheer persistence was driving him back anyway. He cursed, reached for Cort, found her hand, and allowed her to pull him out of the densest part of the Catarkhan mob, and back toward the Sick Ward. The Catarkhans who had driven them back followed, but not in the manner of creatures who wanted to overtake them; rather, they were more like shepherds herding a wayward flock back into a pen. Whalekiller and Cort outdistanced them with ease.

Whalekiller, still holding his eye, grunted in fresh dismay.

"What?" Cort asked.

"I think the little fuck blinded me."

"That can be fixed." Even with the eye a complete loss, the embassy clinic could grow a new one overnight.

"But it still hurts like hell," he said. It



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didn't need to be said; his walk had become an agonized lurch, dependent on Cort's support.

They descended closer to the side-tunnel that housed the Sick Ward. Their pursuers fell back, giving them room, leaving them alone as long as they continued their retreat. At one point, Whalekiller's knees buckled; Catarkhan shadows loomed on all sides; Cort forced him back to his feet and pulled him further along the tunnel; the shadows retreated. It was hard to tell, when Catarkhan fury was so hard to discern, but what there was calmed to something like casual interest.

Just outside the Sick Ward, only a few meters from the site where dying Catarkhans fought to bury themselves in the bodies of other dying Catarkhans, she and Whalekiller sank to the tunnel floor, their breaths reduced to ragged gasps.

"Just . . . my luck," he managed. "Hundreds . . . of diplomats . . . running all . . . over this . . . mudball . . . without ever . . . getting noticed . . . and I happen . . . to be the bastard . . . who . . . finally . . . makes contact . . ."

Cort lurched to her feet, wobbled, held her head, and faced the threshold, where dozens of ailing Catarkhans warred to fit themselves into a space too small to accommodate them. Their bodies, illuminated by her helmet lights, glistened with the blood pouring from the wounds they had inflicted upon each other fighting in that pointless war. The ground beneath them was sodden with it. She focused on that blood now, forcing herself to remember a similar sea of spilled blood; it would have been just another pointless way to upset herself, had she not wanted to be upset, had she not needed the strength that came from being angry. "Have you been able to call for a rescue team?"

Whalekiller tapped his throat mike. "Doing it now." Two minutes of anguished subvocalization later, he reported: "ETA three hours, if Lowrey . . . can scramble his team quickly. Maybe less than that . . . if one of the alien field teams intercept. We'll be okay if the bugs don't swarm us again."

"They won't," she said. "Tell them to bring isolation suits and we'll be okay getting out, too."

He froze then, regarding her for long minutes through his one intact eye. The look was cold, appraising, and a churning cauldron of emotions ranging from pity to disgust; the kind of look one gives other human beings only after deciding that they are not human beings after all, but representatives of an older and more predatory species that should have died out before the first human beings carved the first club out of bone.

Cort had no trouble facing that expression, mostly because she'd been encountering it, off and on, for most of her life. She'd first seen it in a rescue worker's eyes when she was eight years old. She couldn't pretend it didn't bother her. But it was what she had to work with.

Whalekiller's voice was hurt, betrayed. "You knew this would happen, didn't you? You expected it."

"I expected something like it. It solves a lot of problems."

"And you didn't let me in on it?"

"I wasn't sure," she said. "And I didn't want to be wrong."

He grimaced, more out of revulsion than pain, but relayed the message.

She sat down again, her back to the tunnel wall, descending into a silence disturbed only by the sound of Catarkhans, mobbing each other for the right to die in splendid quarantine.

### 14.

The Catarkhans didn't bother them again. As long as the two humans stayed within a certain distance of the Sick Ward, they were left alone, to stew in their separate flavors of misery.

Whalekiller was silent at first, but when he injected himself with an anaesthetic to dull the pain, it made hash of



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his prior decision to ostracize her. It didn't put him out, or render him any less rational, but it did unleash a flow of words, and gave them a distracted, otherworldly quality, like dispatches from another country so distant that its nature was of interest to serious scholars only. He talked a little about his homeworld, Greeve, a place so dominated by ocean that only a few speckled islands emerged above the usually placid surface; and about his name, a reference to the massive ocean-dwelling beasts who occasionally entered the shallows long enough to provide the colonists there with the one source of food they didn't have to synthesize, grow themselves, or import from somewhere offworld. Perhaps because his tongue had been loosened by the neural block, or perhaps because he couldn't forget that he was in the presence of a Dip. Corps advocate, he told her about twenty times that these whales had been named for their extinct terrestrial counterpart only because of their physical resemblance. They were not sentient. They were not even possibly sentient. They were not endangered. They were not even close to endangered. Harvesting them was not a crime. They were mobile meat. They were nothing more.

He was innocent. He was. They all were. Greeve was a good place: a paradise. Really.

But then the nonsentient classification had been challenged in the light of new evidence—and it now seemed clear that the whalehunting on Greeve had been another in a long line of Hom.Sap. crimes against thinking beings.

"I didn't know," Whalekiller murmured. And then, "It was my home."

She didn't point out that he had sold himself into the Dip. Corps to escape it. She had no business criticizing; in a sense, it had been what she had done, too. She may have been a freewoman, but she had been fleeing her guilt too long to believe that anybody ever truly enjoyed that condition.

At one point during the wait of several hours, Whalekiller said that his injured eye was showing a lot of sensitivity to light. He asked if she had any problems with sitting in the dark a while. She said she had none, and they turned off their lamps. Darkness descended. The sounds of sick and dying Catarkhans mobbing each other at the entrance to the Sick Ward continued; they were moist sounds, violent sounds; sickening sounds. Cort, who was sitting cross-legged against the tunnel wall, immediately found herself covering her ears with both hands, blocking out not the sound of Catarkhan fighting but the even more immediate sound of humans and Bocai tearing each other to pieces in another place, worlds and lifetimes ago.

Whalekiller had been wrong about how much she remembered. She remembered hating them, that's all. She had been eight years old, and a living symbol of interspecies harmony—she played with the Bocai young, and she ate at the Bocai feasts, and she amused her human parents with how well she had learned the Bocai songs. She even had a Bocai name, an emblem of her honorary adoption into a Bocai family, a name she had impossibly even learned how to speak perfectly, despite the harsh differences between the human and Bocai vocal apparatus, which had always rendered their interspecies parley such a comic-opera litany of malapropisms and mispronunciations. She had loved them as much as she had loved her own family and she had been loved as much by them in return, but then she'd hated them, and they had hated her, and she had been too small to participate in the fighting, the killing, the burning, the two-way war of annihilation erupting for no conceivable reason one day like any other. Her father's head had been smashed to jelly beneath Bocai farming implements suddenly transformed to clubs, her mother had been torn to pieces beneath Bocai



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hands suddenly transformed into claws. Andrea, too small to participate, and too afraid of the monsters overpowering and destroying her, had hid in a dark alcove, watching, listening, hating, waiting for her moment, emerging only as her Bocai second father crawled away from the fighting, lay there helpless, bleeding, sobbing, helpless. And she had emerged from her little dark place and looked down at the being who had called her his daughter and she had hated him, hated the very idea of him, wanting to expunge him, to erase him, to free the Universe of the very idea of his existence. He had pleaded with her, that being, in his last moments. Perhaps the madness that had rocked his people and hers had already passed from him. But it had not passed from her.

After that day she had wanted no family. Not any more. She wanted no world. Not any more. She had wanted no friends. Not any more. She had harbored no trust for sentients, of any species, not even her own. Not any more.

She just wanted to fight the monsters.

It was the only way to atone for having been one of them.

To not remember her own little hands, driving the cutting blade into her Bocai father's face.

She closed her eyes, and pressed her hands harder against her ears, and retreated into a private place where there was no such thing as time or blood until, lifetimes later, she felt something or somebody shaking her by the shoulders. For one terrible instant her heart spasmed in her chest, as she half-expected it to be a Catarkhan, fully aware of her presence, wanting her awake so it could make her pay for the crimes of Emil Sandburg. Or worse, a Bocai, arriving here from across the years, to hold her accountable for the crimes she'd committed once upon a time. But then she opened her eyes and saw that it was neither. It was a Tchi: not one of the ones she'd met so far, but a younger, shorter individual, whose gray eyes had narrowed in frank confusion.

"Are you injured, Counselor?"

She looked past him: saw a petite human woman tending to Whalekiller, a grave Riirgaan staring open-mouthed at the perpetual riot that raged at the mouth of the Sick Ward, and a flatscreen from the AIsource hovering between them, flashing its symbols for fascination and dismay.

The Tchi asked her again: "Are you injured?"

She felt herself twitch at the corners of her mouth. "Not . . . recently." Allowing the Tchi to help her to her feet, she said: "And Whalekiller?"

"He has sustained an injury to the eye. Painful, but not as bad as it looks; it will probably not require replacement. He suffers from shock, nothing more."

"That's good," she said, oddly surprised to find that she meant it. "Did they give you any trouble getting this far? The Catarkhans, I mean?"

"The Catarkhans were Catarkhans. They didn't even notice us. I will be interested in learning why they provided such an impediment to you."

She said: "They'll be an impediment again unless you brought isolation suits."

"Your call for help specified you'd be needing them. They're here."

"Good," she said.

The Tchi said, "It will be interesting to see if you're right."

"I am," she said.

She was referring to more than the suits, but she didn't let him know that.

## 15.

The meeting of the local interspecies council was held five days later.

It was not a trial. Nobody there could have gotten away with calling it a trial. Trials imply the right to hold them. Nobody wanted to call it a hearing either, as even that term seemed to impart official weight to any conclusions it happened to draw. It was a meeting, nothing more.



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The Bursteeni, who had discovered and named Catarkhus, as well as the first to suggest that its inhabitants might be sentient, hosted the inquiry in their own embassy, which they'd constructed in a salt desert. It was a graceless, windowless block with a flat roof and an interior empty enough to qualify as cavernous. There was nothing about it that seemed to reflect the Bursteeni character; they were traditionally lovers of luxury at home and in the field. But here, in their planetary base of operations, they behaved differently; they kept almost no equipment and absolutely no furnishings here, but instead stored the things they really needed at various drop points around the planet, and conducted the day-to-day business of their embassy at this hall so large it would have seemed almost as empty if it were allowed to house everything they possessed. Nobody had been able to explain this to Andrea Cort, who in the end just wrote it off as one of those maddening alien-psychology quirks that, like the mysteries of the Catarkhans themselves, seemed to exist only to twist the brain of human observers into Gordian knots.

Regardless: the site's nondescript flavor made it infinitely adaptable to any purpose, and therefore perfect for those rare occasions where the various first-contact teams on Catarkhus all needed to meet in one place. Each of the various alien races on-world brought their own native version of furniture to accommodate themselves—the Hom.Saps their functional tables and chairs, the Tchi their imposing portable stages, the Riirgaans their ornately-carved reclining benches, the various other races' odder artifacts ranging from hammocks to poles with protrusions to dangle from. The Bursteeni sat on the floor and a flatscreen representative from the AI hovered two meters above it all, its usually-colorful surface now projecting a studiedly neutral black. They were all gathered in an approximate circle, creating an empty stage at the center where the various presentations would be made.

Almost all the human beings on Catarkhus attended, but most of those were at the outer fringes of the audience. There were only three people seated at the table provided for the Hom.Sap. contingent—Ambassador Lowrey, the fully-healed Roman Whalekiller, and, confined to a paralysis chair for security reasons, the cause of all this bother, Emil Sandburg himself. He managed to look chipper despite his temporary, artificially-induced state of quadriplegia; he was cheerful enough to catch Cort's eye, and smile at her. At that, he was friendlier than Whalekiller, who had refused to accept her visit during his stay at the embassy clinic, and had been nothing but chilly and professional to her since his return to duty, eliminating all the affability that had previously made him such a trial for somebody with Cort's reserve.

Cort, who had as per her usual habit rejected a seat of her own, stood by herself until Sandburg winked at her. Then she crossed the stage to stand before him. "Still enjoying yourself, I see."

Sandburg beamed. It was the look of a man in control, who expected to remain in control. "Why shouldn't I be? I love theatre."

"And that's all this is to you."

"I'll be more specific. It's not just theatre; it's farce. It's just a bunch of sentients who wish they could take me out back and shoot me, but are too hamstrung by their own rules to do anything but cluck."

"You're not worried, then. You're that certain the Catarkhans can't judge you?"

He sneered. "The Catarkhans can't judge anything."

She nodded, not because it might have been literally true, but because she recognized the nature of Sandburg's anger. It crystallized something she'd come to realize about his crimes—something that rendered the most basic assumptions about them a lie.



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Whalekiller, who was seated beside Sandburg, grimaced: "There's that smile again."

A few days earlier, during her investigation, the words would have reeked of wry affection; now, nothing informed them but resentment.

She confronted it head on. "I've got to watch that. I wouldn't want to get obvious. How's the eye?"

"Fine. You got this handled?"

"It's handled," said Cort.

Lowrey lowered his head and spoke with soft urgency. "It's not going to be that easy, you know; I've been told that Rhaig's lying in wait for you."

"We already knew that."

"We knew his agenda. We also knew that he's been wanting to politicize this since day one. We suspected, but didn't know for sure, until now, that he was going to aim much of his attack against you."

"And how do you know that?"

Wringing his hands so tightly that he might have been trying to remove them at the wrists, Lowrey said: "Rhaig went to the Riirgaans to try to recruit supporters for his side. He figured they'd want to support him; they were, after all, key in cleaning up the ambassador's screwups during the Vlhani mess last year. But we still have a supporter or two over there, and one of those called to let us know that he's ready to cut you off at the knees."

"So he's making this about me," Cort said.

"What else did you expect, when you insulted him to his face?"

And she smiled again, without any warmth at all, making sure it was clearly visible to everybody in sight.

"I expected him to make this about me," she said.

At precisely the moment the schedule dictated, Mekile Nom of the Bursteeni called the meeting to order by praising every race represented there at excessive length. He was, he assured everybody in turn, a longtime admirer of all their cultures, all their accomplishments, and all of their efforts in the allied fields of exosociology, exolinguistics, and exodiplomacy. He praised them further for the spirit of cooperation that occasioned this hearing, expressed his extreme gratification that so many distinguished sentients had chosen to participate, and conveyed his approval of the conclusions that were about to be reached, whatever they were going to turn out to be. He seemed so pleased by the sheer wonderfulness of everything that the hearing might as well have been a party with himself as the guest of honor. That was the Bursteeni; they tended to get carried away with their enthusiasm. By the time Nom relinquished the floor to Cort, so she could give her report, she felt like she'd won half the battle just by curbing the tidal wave of superlatives.

But she had barely begun her first sentence when Rhaig stepped forward and said: "Excuse me—but with all due respect to the purpose that brought us here today, I must raise serious objections to this woman's presence here."

The general murmur that greeted this statement was punctuated by a few angry shouts, most of those human. The cries of protest from Ambassador Lowrey were especially loud; unfortunately, so were the hoots of laughter from Emil Sandburg. Cort herself said nothing, content to let the next few seconds play themselves out.

Nom's face wrinkled with a series of dumbfounded blinks. "Her presence? On the grounds?"

"On the grounds that the real issue here today isn't the psychological aberration of one diseased individual, but the habitual Hom.Sap. arrogance toward less developed peoples." Rhaig's words boomed across the chamber, dominating the assemblage despite the dull roar that began to swell before he was even finished with his sentence. He didn't wait for the tumult to subside, but instead spoke louder, riding out the spec-


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tator reaction, beating it down, and finally conquering it. "Justice isn't about punishing crimes, or even about providing victimized peoples the means to fight for justice; it's about taking steps to ensure that such crimes never happen again. To do that, in this case, we must recognize where these crimes are coming from. To do that, we must recognize that the human species has been committing such crimes with monotonous regularity since they first climbed down from the trees—and that they haven't slowed down after finding their way to the stars. It's a constant, with these people." He gestured at Andrea Cort. "Even with our colleague, the learned Counselor from the Hom.Sap. Confederacy. That's why I protest her involvement: because she has a history of participating in crimes just as heinous."

The roar erupted again: a tidal wave of noise, overwhelming the decorum of the proceedings, turning the room into a polyglot of shouted words in a dozen separate languages. Even the AIsource flatscreens, which usually communicated only in raw fact, scrolled their text so frantically that the flashing effect made them seem to be shouting. Andrea Cort, still keeping her own counsel, noted only that Whalekiller was among those shouting . . . and that the smiling Emil Sandburg was not.

Rhaig continued: "It happened a long time ago, so you might not all know the facts of the case—but many years ago, on a world called Bocai, a small colony of Hom.Sap. settlers turned on the indigenes who had been living alongside them in peace with a savagery that outdid anything the demented Mr. Sandburg has done. From all reliable reports, every able human in the colony participated—even the children—and the peaceful Bocai needed to resort to violence themselves in order to defend their families. One of the human criminals, caught with Bocai blood beneath her fingernails and between her teeth, was a young child only eight years of age by the human OES scale; a child who sane justice would have condemned as a threat to everything to lived, but who was instead rewarded—REWARDED," he shouted with sudden rage, "with adoption by the Confederacy Diplomatic Corps and training in a career with their judge advocate! Do we want to honor their hypocrisy by allowing such a creature to speak? Do we?"

The roar that had filled the chamber now engaged in pitched battle with itself, the universal desire to shout louder, to protest louder, to be louder, acting as natural enemy to the simultaneous need to choke back all that noise and hear whatever Andrea Cort had to say in response. Cort did not make the amateur mistake of trying to answer the Tchi's charges too soon; instead, she just remained silent, her face impassive, her demeanor calm, her attitude that of a woman in no particular hurry to be heard.

It was an open dare to Counselor Rhaig, to continue haranguing her.

But Rhaig, who had evidently expected the kind of fight that would have permitted him to shout her down, had peaked too early. He had nowhere else to go. He had to fall as silent as everybody else, awaiting either Cort's reaction or the reaction of whoever stepped forward to defend her.

The roar died to a murmur. Then a moment of hoarded breath.

Cort did not rush to fill the silence. She just waited one . . . two . . . three . . . beats, while the mood of the gathering moved from anticipation to out-and-out worry.

Mekile Nom leaned forward. "Counselor Cort? Do you have any response to that?"

She held the silence one more heartbeat, and said, "Yes."

She stepped forward, speaking in a soft murmur that commanded attention from all the sentients who otherwise might have been moved to drown her out. "Counselor Rhaig is correct. I was



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at the Bocai Massacre. I participated in the Bocai Massacre. I—" She paused to allow the renewed hubbub another second or two to die down. "I was a child at the time. I will further point out that the incident in question involved not one, but two separate communities both erupting in unmotivated violence against each other for no apparent reason. The madness they shared was so savage and so unmotivated that debate has raged for years over the possible existence of an organic or environmental factor beyond their conscious control. No independent investigation has ever succeeded in determining the cause. Even the Bocai themselves have refused to fix blame, and it was, after all, their world."

"And their fear of human reprisals had nothing to do with that?" Rhaig said. "Counselor! Really!"

Cort proceeded as if he hadn't spoken. "If anybody present here today wishes to review the facts to determine whether I'm truly as guilty of great crimes as Counselor Rhaig claims, please feel free; I personally agree with him, and I've taken the precaution of sending the full text of the interspecies investigation on Bocai to each of your embassies by hytex. But regardless of how you ultimately judge me, NONE," she said, repeating the word for emphasis, "NONE of what you decide to believe about me should affect what I came here to say; the facts I offer cannot be changed by the character of the sentient who speaks them. The implication that they might has more to do with Counselor Rhaig's private agenda, and his own complete shamelessness, than it does with the reason we're here."

She let that thought sink in, and scanned the room for reaction; she saw sympathy, disgust, admiration, loathing, anger, and even sheer confusion. But they were all listening. They were, if anything, paying closer attention than they might have if Rhaig hadn't smeared her. She spotted Mukh'thav among the Riirgaans and Haat Vayl among the Tchi; neither had shown her particular sympathy during their interviews, but they were both as rapt as hungry men offered their first meals after long enforced fasts. She glanced at the Hom.Sap. contingent next, and saw that (the grinning Sandburg aside) they'd all been affected the same way—but then they couldn't be blamed for such a reaction after Rhaig had attempted to magnify the issue into a judgement on the entire human race. She had their support, for whatever that may have been worth.

She certainly had Whalekiller's. Though still seated, he resembled a coiled spring about to leap. His eyes flickered toward Rhaig, then caught hers. She could not quite read what she saw there, but anger on her behalf was part of it.

She allowed her lips to twitch, and moved on: "However, one thing Mr. Rhaig said is relevant to my point; he cited what he called the human attitude toward less-developed peoples. I liked that phrase. Less-developed peoples. It says less about human beings than it does about the assumptions that brought us here today. Our assumptions toward the very people whom this hearing is supposed to be about." Addressing Rhaig, she asked: "Is it your belief that the Catarkhans are inadequate in some way? That they need to be developed? That they'd be developed, in part, by the ability to communicate with us?"

Rhaig feigned nausea. "The Counselor is twisting my words—"

There was more, but she rode over it, reclaiming the floor as easily as he'd claimed it for his previous attack on her. "I am pointing out that the First-Contact Protocols which have served us so ably elsewhere are less than appropriate for this species. As much as all our own races have benefited from our mutual association, from our cultural and technological exchanges, from our free trade and from the opportunity to see existence through differently evolved per-



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spectives, we all have to admit that the Catarkhans were doing just fine by themselves before we came along. Maybe all of our attempts to contact them have just been an exercise in gratifying our own egos. Maybe we think we can elevate them by finding some way to make them notice us. And that's not true. We can't make them notice us. We can only disturb them in ways they're not evolved to handle."

"Ways that include murders committed by humans," Rhaig said.

"By a single diseased human," Cort said, "but yes. And what about our insistence on including them in our efforts to seek justice for crimes committed on their soil? It's well-meaning enough, and it's perfectly appropriate when we're dealing with species capable of understanding concepts like crime, but isn't it perverse to require Catarkhan input when providing input of any kind seems utterly alien to their fundamental nature? Doesn't that say more about what we need from them, than what they need from us?"

Rhaig, who had been staring at her throughout her speech, unable to determine where she was going with this, took another shot: "You all see where the Hom:Sap. counselor is going with this. She is making excuses . . ."

"No, I'm not," she said, with an insistence that immediately shut him up again. She turned as she spoke, addressing all of the gathered sentients in turn. "There are no excuses here. I want Mr. Sandburg to face justice as much as you all do. But I'm asking you to recognize that requiring him to be judged by Catarkhan standards is by definition requiring them to develop standards. That's defining them by our rules. That's denying them protection from people like Mr. Sandburg, because we have trouble living with the awareness that they don't need the rest of us either. And that," she said, directing her last words to Mekile Nom, "is a crime, just as surely as anything Mr. Sandburg did."

That disturbed the little Bursteeni. Silencing Rhaig, who had a no-doubt outraged response to this, with an outstretched hand, he regarded Cort through eyes turned gray with moral exhaustion. "These are not exactly startling arguments," he said, "and they don't change anything about the essential problem here. The First-Contact Protocols—"

". . . don't apply here," Cort said.

That caused a stir. A small one, that didn't even begin to match the response to Rhaig's revelations about her, but a stir nevertheless. All around her, the chamber turned electric with the knowledge of a net about to drawn tight.

Nom, wary but unable to anticipate her intent, said, "The last thing I heard, Counselor, this was supposed to be a first-contact mission."

She directed her next words not at the presiding chairman, but at the entire chamber: "Then, why, precisely, aren't there any Catarkhans attending?"

Silence.

"They're not here," Cort said, "because it makes no sense for them to be here. They wouldn't participate. They wouldn't pay attention. They wouldn't understand. They wouldn't care. They wouldn't even know that any of this was happening. Oh, we could bring some here by force, but they wouldn't be ambassadors—they'd be prisoners. Or worse—specimens."

"That doesn't excuse killing them!" Rhaig shouted.

"No, sir, it does not. But it does change the nature of the crime, and it does simplify the issue of finding justice. It eliminates the need to shackle ourselves with the protocols for first-contact."

Rhaig practically exploded at that. "How?"

"The Catarkhans," she said, smiling broadly now, "have not been contacted."

* * *



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16.

The pandemonium that followed arrived in slow-motion. It was Nom who got it first. Typically, for a member of his species, he reacted with effusive appreciation, bobbing up and down in his seat like a cork, waggling his fingers with glee. "Oh, very good, Andreacort! Very good!" The Hom.Sap. contingent erupted with gasps and muttered damns. Emil Sandburg woo-hooed, the AIsource flatscreen flashed A FINE ARGUMENT in Hom.Sap. standard lettering, the Riirgaans exploded with frenzied consultation, and then the shock just rippled through the room in waves, turning the gathering into a babble of voices demanding to know if it could possibly be as simple as all that.

Rhaig attempted to reclaim the floor: "I fail to understand how my colleagues can celebrate such a self-serving Hom.Sap. tactic."

"They celebrate it," Cort said, "because they felt as trapped by the seeming confines of the law as we did. They knew there was no way Sandburg could be judged by the Catarkhans. They just didn't see, until now, how we were going to get around that fact."

"Justice," Rhaig said, "is not an inconvenience to be . . . gotten around."

"Nor is it something to be penned behind false barriers," Cort said. "That was in danger of happening here. You believed that because you were here on first-contact missions, that this was a first-contact situation—while the facts quite clearly illustrate that it's nothing of the kind. It can't be. First-contact hasn't been made yet."

"I would call murdering sentients in their homes a pretty definitive form of contact, Counselor."

"I would, too—but then my human perspective, and your Tchi viewpoint, are both totally beside the point here. That's why I spent so much time during my investigation consulting so many of you, confirming that Mr. Sandburg's crimes didn't constitute a form of contact." She addressed Rhaig: "Remember, Counselor? When I asked your expert, Dr. Vayl, if punching you in the face would qualify as a form of communication?" The gathering rippled with laughter, some of it from Dr. Vayl. She continued: "Vayl said yes, even if the differences between our species prevented you from knowing what that punch signified. He said that inflicting pain qualifies as communication. A low form of communication, he said, but communication nevertheless. And I agree, it does. If the Catarkhans victimized by Mr. Sandburg had been able to suffer pain, then the First-Contact Protocols would be in force now.

"But Dr. Mukh'thav of the Riirgaans assured me that Mr. Sandburg's crimes, brutal as they were, did not include torture, because it was utterly impossible for the Catarkhans to have felt pain, or even to know what was happening to them. A message may have been sent, all right . . . but none was received. Therefore, no first-contact.

"I'll even cite a precedent. There was a case, several years ago, where a starship from a species I won't name jettisoned waste radioactives in an inhabited system. It was a stupid and irresponsible thing to do, and it resulted in serious environmental damage when the radioactives entered the gravity well of the world with sentient aboriginals. There were arguments, then, that the criminals in question should have be judged by the aboriginals they had so grievously harmed. This would have presented serious difficulties, as there had been no actual physical contact, and explaining the nature of the crime to the aboriginals would have required first making contact, then establishing communication, then explaining radioactivity and space travel to them first. It was judged that the crime itself did not constitute first-contact, and that the crime could be dealt with by existing interspecies law. So, too, with this."

"That was accidental contamination!"



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Rhaig shouted. "This was deliberate murder! You can't compare the two!"

"I don't intend to," Cort said, "since, as it turns out, assigning jurisdiction doesn't really matter here anyway. There's yet another issue."

Whereupon she told them what they should have known all along.

17.

The closing statement of Counselor Andrea Cort, edited to remove various ineffectual interruptions by the Tchi Gayre Rhaig:

A. CORT: Ironically, even if this inquiry eventually finds against this argument, and concludes that the First-Contact Protocols still apply in this case—that still has no bearing on what we ought to decide.

Politics aside, interspecies resentments aside, our decision on the matter of Emil Sandburg turns out to be an obvious one; we just haven't examined the situation closely enough to recognize the inevitable even as it looms before us waiting for us to notice it.

But when the story of this case is told, the students of interstellar law will note that there were really, always, only a limited number of ways we could have dealt with Sandburg.

If you eliminate letting him get away with his crimes—an option we must all as civilized peoples reject with total revulsion—there are, in fact, only three.

We could have judged him by our best approximation of Catarkhan law.

We could have deferred the question, until we were able to establish communication with the Catarkhans and find out for sure what they wanted.

Or we could have judged him by Human law, since Sandburg also broke the laws of the Corps he was supposed to represent.

Three possible approaches.

All equally legitimate; our wrangle over jurisdiction has prevented any one of them from being chosen.

But let us examine their implications.

Deferring judgement would delay this case for years, maybe even lifetimes. Mr. Sandburg would have to be imprisoned until he could be judged. If we never establish contact, it amounts to a life sentence.

This is conveniently enough the same thing human judgment would want.

As for Catarkhan law, that's a little more difficult to determine—especially since I've been told time and time again that the Catarkhans don't have laws. But that's nonsense. They do have laws, and we all know they have laws. They have laws so strict that they never even think of breaking them.

Except we don't think of them as laws, because we call them instincts instead. They may be hardwired in the genetic code, but they're definitely rules of conduct—which Catarkhans follow with absolute dedication.

Who ever said we couldn't consult those laws to see what a Catarkhan would do to somebody like Mr. Sandburg?

We can't be exact, of course; Catarkhans don't have murderers. But they do have analogous situations. Specifically their way of dealing with diseased individuals who threaten the rest of the community. They quarantine such individuals in special chambers where they can't endanger the rest of the hive with their sickness. They keep those individuals imprisoned as long as the threat remains real. Of course, sick Catarkhans quarantine themselves voluntarily—but, as I recently arranged for Mr. Whalekiller and myself to confirm, when we saturated ourselves with the secretions of one desperately ill individual, sick Catarkhans who don't quarantine themselves have quarantine forced upon them by the rest of the community. In short, they're isolated until the illness runs its course, or until they die . . . whichever comes first.

Mr. Sandburg is a diseased individual whose presence threatens the rest of his community. By human law, he should be



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imprisoned; by Catarkhan law, he should be quarantined. The difference between that and the human solution is a semantic one, but this is a diplomatic issue; we're willing to use the word you prefer.

That's what I meant when I said it doesn't matter. Because we were all in perfect agreement all along. We just weren't paying enough attention to see it.

**18.**

The Council went for it, of course. They had no other choice; denying her logic would have meant perpetuating the deadlock that prevented Sandburg from being tried. Nobody wanted that, not even those who would have preferred to keep the shame on mankind's shoulders.

The Cort Compromise, as it would come to be called, would be painted a triumph of interspecies diplomacy; her argument would be quoted, analyzed, fussed over, and dissected long after the words themselves became dead things, drained of meaning by their very overuse. In the years to come, they would even be abused, by advocates seeking to overturn local sovereignty in cases of crimes committed by offworlders; they would be applied, with questionable accuracy, to cases of crimes committed against locals far more receptive to communication than the Catarkhans. Andrea Cort's precedent was as vilified in those cases as it was praised now.

In a subsequent hearing, the Interspecies Council ruled in favor of life imprisonment for Emil Sandburg, that sentence subject to future alteration by Catarkhan authorities—a circumstance that, given the apparent impossibility of communicating with Catarkhan authorities, nobody really expected. Arrangements were made for Sandburg's transport to a maximum-security facility on New Pylthothus, the same prison housing the convicted culprits in previous diplomatic crimes on Hossti and Vlhan.

An attempt by Counselor Rhaig to bring censure proceedings against Andrea Cort, on the basis of her physical threats against his person, met with a resounding lack of interest; indeed, the Hom.Sap. embassy forwarded to her several messages from other embassies that had dealt with Rhaig and empathized with the urge. Even so, Rhaig announced his attention to file his complaint with the Dip. Corps judge advocate. Cort would probably have to face some minor disciplinary action, which wouldn't bother her all that much; she had always been considered a problematic personality, whose reputation had been soiled beyond repair long before the first day she had ever spent on the job. It didn't matter when she still got the job done.

Ambassador Lowrey praised her at length for her brilliance; so did Mekile Nom of the Bursteeni, Goodsir Mukth'av of the Riirgaans, and Haat Vayl of the Tchi. She accepted the compliments without much response, not trusting them to mean what they were supposed to mean on the surface. Politics was, after all, the creation of sentience. She did what she had to do to respect protocol, and then retreated as soon as possible.

Cort received word of another crime on alien soil—this one a bored embassy worker who had become quite prosperous selling his coworkers the sacred hallucinogens the local indigenes reserved for their honored priesthood. The aliens were willing to settle things by declaring the idiot in question an honorary member of their clergy, but he was desperate to avoid the mandatory gender realignment surgery. It may have been a shit case, as such things go, but Cort found herself looking forward to it; after Catarkhus, it would be a relief dealing with a crime that involved no savagery, and indigenes capable of arguing their own interests.

Everybody thought the matter was settled.


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Everybody except Andrea Cort.

When the Hom.Sap. embassy held a victory celebration—one that could not be called a victory celebration without offending the other embassies, but which served precisely that function nevertheless—she declined to attend. Habit would have made her stay away anyway, but there was more to it this time—enough that, as she stood outside the compound walls, buffeted by wind and the sound of distant music, she often trembled despite the warmth of the night. Sometimes she stared into the empty air around her, and asked it questions beneath her breath.

Whalekiller came out, dressed in his formals, carrying a drink for her. He said: "It occurred to me that I ought to stop being mad at you."

She didn't take the drink. "That's your choice."

"You didn't know that the Catarkhans would react as violently as they did. You expected a reaction, but not one that extreme."

"If you say so," she said.

Whalekiller waited for more, closed his eyes in brief frustration, and spread his hands like a man casting cards upon a table. "You could make a pretense of giving a damn."

"It wouldn't be a pretense," she said. "I'm not a robot."

"You make a big show of trying to be," he said.

"Maybe I have to. Maybe that's what I'm left with."

There was just enough bitterness in her voice for Whalekiller to assume he knew what she was talking about. He sighed, put the drink down on a post beside her, and said: "And maybe that's just self-serving bullshit. Maybe we all have garbage in our pasts—some of it petty next to yours, some of it just as bad as yours, some of it downright worse. Maybe some of us throw away that garbage while some hold on to it like it's a family heirloom too valuable to lose. Maybe that says less about how painful that garbage was, than about how much we deserve to stay alone."

"Maybe," she said, her gaze level. "And maybe I'm not even close to being alone. Maybe I've been surrounded all along. Maybe I'm surrounded now."

His eyebrows knit. "You lost me with that one, Counselor."

His incomprehension left her tired. He really thought everything was settled. But if such an intelligent man, who had devoted his entire career to communicating with alien minds, could spend so much time with the Catarkhans and not see the deeper implications, how much of a chance did she have of persuading the rest of humanity? For a moment, she wondered if she'd be better off just giving up . . .

Unfortunately, giving up had never been in her nature.

She accepted the drink he'd offered and swallowed it in one gulp. "You're a good man, Goodsir Whalekiller. I just hope you find a way to live with it before it breaks your heart."

"Thank you," he said. "And I believe you're a good woman, Counselor Cort. I just hope you find a way to believe it while it can still make a difference for you."

She wanted to argue the point. But instead she nodded and returned to her quarters without speaking even one more word to anybody.

### 19.

Early the next morning, she arranged admission to Emil Sandburg's cell. She knew as soon as she entered that the other monster had experienced a night almost as bad as her own; the arrogance and sarcastic affability that had distinguished their first meeting was now completely gone, replaced with a red-eyed desperation that his keepers had misdiagnosed as a mere psychotic mood swing. Fear that he might try to hurt himself, or attack one of his infrequent visitors, had led them to fix him up with partial nerve block; it didn't paralyze



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him all the way, like the chair that had imprisoned him during his trial, but it did lend every move he made a curious slow-motion quality, as if the very air around him had been thickened to the consistency of gelatin. There was nothing slow about his trembling, though. The man was terrified.

A funny thing she noticed at once: with the fear upon him, the arrogance he affected was easy to see as the mask that it was. The bland and unformed personality his fellow indentures had seen now stood out in sharp relief, revealing a man without distinction, without edges, without blood beneath the skin. He was, as his Dip. Corps profile had indicated, a nobody. A void. One who had been able to reap the dubious benefits of infamy for a short interval, but nevertheless, still just a void.

She tried to fight feelings of sympathy for him, and failed. After a moment she pulled over a stool that somebody had left in his cell and broke longstanding personal policy by sitting down in the presence of another human being. "Hello, Emil."

"Hello, pretty lady." He attempted to energize his smile with some of his old arrogance, but failed. He was a man trying to reclaim a vocabulary he had possessed for a short time, but which had been lost as completely as his freedom. "Come to gloat?"

"I don't gloat," Cort said.

"You probably don't. You don't laugh, either. Or cry. Or do much of anything else, I guess. Leftover trauma from your violent childhood, I suppose? Did you enjoy killing as much as I did?"

She wanted to respond with the same sternness she had shown toward him during their first interview, but there was no point; he was already defeated, and this was just bravado. Needing more of him than that, she took a small spherical device from her pocket, flourished it before Sandburg, and placed it on the cell's pull-down tray table. Depressing a thumb-sized cavity at one end of the device, she said: "There. That'll scramble the monitor system. Nothing you or I say to each other in the next few minutes will ever be seen or heard by anybody else."

He licked his lips. "That leaves you awfully vulnerable if I decide to kill you."

It was a weak threat, uttered because he seemed to think it was expected of him; there was little he could do in light of what the nerve block had done to his reaction time. But she treated it as face value anyway: "You're free to try, Emil. But as you're so fond of noting, you're not the only monster in this room. Provoking me to violence would be a very bad idea."

An acknowledging tired nod. "So what do you want?"

"I wanted to speak to you one last time about your crimes."

He seemed infinitely tired. "Maybe we should talk about yours."

"That's all right," she said. "I don't really want to have a conversation with you, Emil; your gamesmanship is too boring for that. I just wanted to let you know that I figured out your secret. I know what you're all about.'

"Well, la-de-da."

"It took a while to see it, mostly because your coworkers here, human and alien, have all been so busily painting you as a sadistic killer."

"I am."

"Maybe you are and maybe you're not. You certainly enjoy having people think you are. You've played the role very well, Emil; so well, in fact, that for a while, dealing with you, I had trouble seeing the empty, faceless little man your coworkers described. It must have been fun, being somebody. Even a monster. At the very least it must have been a novelty for you."

"Shut up."

"You never came out and said it, but you did everything you could to make us believe that you committed murders before Catarkhus. You encouraged any-



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thing that bolstered your image as a sadistic monster. It couldn't have been hard. It even seemed reasonable in context. After all, killing is such a messy business that it takes genuine enthusiasm for anybody to make a regular habit of it. Sadism would be a good explanation for that kind of thing, and the pleasure you took in taunting us seems to argue for that. Except," she hesitated, then pressed on: "it doesn't enter into the killings here, does it, Emil? It couldn't have. These were Catarkhans. They didn't feel pain; they didn't even feel fear. You had to have some other reason for going back to them time and time again."

"Maybe I have a rich fantasy life," he said.

"I thought of that; killing Catarkhans, who won't notice and won't complain, is a safer alternative to carving on Tchi or Bursteeni or even your fellow Hom.Saps, all of whom would tend to raise more of a fuss. If you wanted to indulge a compulsion at minimal risk, killing Catarkhans would be the way to go. Except—if you really were driven to inflict pain, killing Catarkhans wouldn't satisfy you for long, would it? A connoisseur of pain, driven by his love of pain, would soon find torturing them about as enjoyable as chewing paper."

"I know people who chew paper," Sandburg said. "Disgusting habit."

"So's killing," Cort said. "Even in the absence of sadism."

Sandburg closed his eyes, looked away from her, and began to hum a vapid love song currently popular on the nets. It was, Cort realized, the same song he'd been humming during her first onworld briefing, when the diplomatic staff had shown her the real-time images of his imprisonment. His rendition of it had not improved. But the meaning of it had changed. Back then humming it had seemed the arrogance of a man who didn't care what happened to him, and now it was just a pathetic series of sounds made by a soul desperate to block out the truth he did not want to hear.

Cort, driven by her own wounds, was the last sentient alive capable of showing him mercy. "A nobody," she said. "A deficient personality. Low charisma, low empathy. Utterly forgettable. Leaving no impression anywhere he went. Joining the Dip. Corps to make contact with something. Anything. Not succeeding even there. Cruelly assigned to establish contact with creatures incapable of even acknowledging his presence."

He hummed louder; he even started rocking back and forth, like an autistic child desperate to retreat into a world of his own.

She leaned forward and yanked his hands away from his ears. The move took him totally by surprise. He emitted a little squeak, and flinched; a big bad monster, trembling like tissue under a gale-force wind, not afraid of being struck, but terrified beyond reason at the simple threat of being understood.

She whispered it: "You can't stand being invisible, can you, Emil?"

He yanked his hands free, hugged himself, and faced the floor again.

She said: "You took your time killing them—because you were willing to do anything you needed to do to get them to notice you."

He said nothing, and did nothing.

"In your own desperate way," she said, "you were actually attempting first-contact."

Again, he responded in no obvious way. But without moving a millimeter, without making a sound any of the monitors could record, he succeeded in answering her anyway. She could see the answer in the way all the strength seemed to drain from his bones.

She watched him for several minutes, taking his measure in the weight of his silence. She had thought him another monster, and painted him large enough to fit the role; but there was nothing large about him, nothing substantial that deserved all the time and effort that had



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been devoted to his case. He had just been the sum total of his illusions, and nothing else. Now that she'd stripped even those away, there was nothing left. It deflated him, reduced him to the nonentity that he had been before and would now be again. Just before she left him for the last time, she could almost imagine she saw his flesh going the way of his pretenses, his skin and bones and muscle turning transparent as what little substance he had dissipated into the recirculated air of his cell.

Prison would destroy him. He would disappear into a population of true monsters, who would either victimize him or ignore him. Either way, he had nothing to look forward to. Nobody would pay any special attention to him ever again.

But he had made a difference, without knowing it.

He said: "Go away."

She said: "Not yet, Bondsman. There is one other thing I want to share with you. It has to do with what happened at Bocai."

He murmured: "I wasn't there."

"It erupted out of nothing, Emil—there were no resentments fueling it, no unresolved conflicts motivating it. There was just pure, savage hatred, arriving as if by spontaneous generation in the midst of two communities who had committed to living in peace. I never thought I stood a chance of understanding it . . . until I saw what you did to the Catarkhans."

He met her gaze again, and this time his despair was mixed with a dose of sheer incomprehension. She didn't blame him; there was no way he could help her with this part. But he was the only other monster present, and therefore the only other person who deserved a share of it.

She said, "We walk among them, talk to them, move them around against their will, get aggravated and—in your case—even murderous because they refuse to notice us. But what makes us think we're any better? Why are we so sure we're seeing and feeling and hearing everything there is to see? How do we know there aren't other first-contact teams, from species we're not equipped to sense ourselves? How do we know that they're not all around us? In fact, how do we know that they're not just like you, frustrated to the point of madness because we don't have what it takes to notice them?"

Sandburg stirred. "Unseen presences." A little of the monster's previous arrogance came back to him, then. "You're crazier than I am."

"And if some imaginative Catarkhan told his friends that there were invisible people walking around among them, trying to get them to pay attention? What would they say to that?"

He looked past her, through her, through even the walls of his cell, seeing not the shape of his cage but the shape of the idea that was forming. His lips twitched, the look of a man fed an exotic treat who was trying to decide whether he liked it.

Cort said: "Maybe it's the kind of idea you have to be crazy to imagine. Maybe it's the kind of idea you can only believe if you're desperate for some kind of absolution. But that doesn't mean it's a bad idea—just an old one we thought we could safely outgrow. Maybe the demons who we used to believe influenced all our worst impulses actually do exist—and we were only wrong about what they were and where they come from. Maybe they come from all around us, and we're just not equipped to see them. Maybe that frustrates them so much they get even by pulling our strings." She took such a deep breath that the rest of her words emerged in a half-hysterical shudder: "Maybe one was with us on Bocai. Maybe one was with you here."

For a moment, Sandburg seemed desperately anxious to believe it. Then he shook his head and delivered the verdict with as much contempt as he could:


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"And maybe this is just you, seizing on any explanation that frees you from the ultimate responsibility for what you did."

"I thought of that, too," Cort said. "I just don't believe it anymore."

The black rage bubbled up in him, then, dispelling—at least for the moment—any remaining sense of defeat in his bearing. His face contorted in a grimace, his hands curled into fists, and he stood so suddenly that she winced, imagining imminent violence—but no; the nerve block was still in place. It was disgust and not bloodlust that had returned some semblance of power to his limbs. "Then I'm better than you, Counselor. Because I know I did what I did, and I don't look for excuses. If you must, you should listen to Rhaig and read a history book sometime. Because we don't need demons to act the way we act."

"Maybe," she said, facing his anger with an equally dangerous calm. "And the hell of it is, you're almost certainly right. But from this moment on, my life's about finding out one way or the other."

She stood, and placed her hand on the scrambler device, resting her thumb on the activation switch, but not yet applying the minuscule degree of pressure that would once again allow Sandburg's warders access to everything that was said and done in this room. She wanted to press it now; strictly speaking, she even should. But part of her resisted, knowing that once she did she'd have to return to the greater world outside, a place where she would once again be infinitely more alone than she ever could be here, in the presence of another monster.

Sandburg, who perhaps sensed the same thing, and maybe even sympathized with her against his will, simply glared at her, waiting.

She smiled at him before she left: the same smile Whalekiller had seen and come to dread. And made her promise:

"And if I do find them, I'm going to make damn sure they're properly judged." ■

*This one's for Joey and Debbie Green.*

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SCIENCE FACT

# ARE WE AFRAID OF A LITTLE FIRE?

## Exploring Space May Require Nuclear Rockets

**Dr. Steven D. Howe**

The potential benefits of space exploration to humankind are tremendous. Space is not only the final frontier, but also the next marketplace. The orbital space above Earth offers tremendous opportunities for both strategic assets and commercial development. The critical obstacle retarding the use of this space is the lack of low-cost access to orbit. Farther out, the next giant leap for mankind will be the human exploration of Mars. Almost certainly within the next 30 years, a human crew will brave the isolation, the radiation, and the lack of gravity to walk on and explore the Red Planet. Both of these missions will change the outlook and perspective of every human being on the planet. However, these missions are expensive and extremely difficult. Chemical propulsion has demonstrated an inability to achieve orbit cheaply and is a very high-risk option to accomplish the Mars mission. An alternative solution is to develop a high-performance propulsion system. Nuclear propulsion has the potential to be such a system. The question will be whether humanity is willing to take on the challenge.

### The Challenge

Risk. How do we gauge risk—to a country, or to a civilization? At what point do the benefits offered by an action outweigh the perceived risk? Here, "perceived" is the operative term. Risk is estimated—the true risk is never known until the adventure is complete. So the actual risk is a guess in the minds of those who, more often than not, are not involved in the action.

If humanity is to explore the Universe, we must overcome the obstacles presented by those who would prevent us from taking even the first step because of the perceived risk. Exploration is a risky business. Explorers will die in lonely places. Fortunes will be lost—and made. Therein lies the rub—what are the benefits? Why should a country risk anything to explore space? Why not fix


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the problems on Earth first before we go traipsing around the Solar System?

To go or to stay? This question has divided humans for centuries. Humans seem to be split into those who would stay at home to fix humanity's problems and those who simply have to see what lies beyond the next hill . . . and the next. Those who wish to stay and wait must consider the possibility that the social problems are never ending—that at no point in the future will the problems at home ever be considered solved. They must consider the possibility that animals held in a closed ecosystem will not reach a steady-state, balanced, in-tune-with-nature existence. Instead, we will find that populations will increase, resources will deplete, wars will be fought, and poverty will always be with us.

The stay-at-homes must even consider that the staying-at-home *is* the problem. The lack of a frontier, of an open expanse to explore, is to a civilization what a cage is to a wild animal. The ability to explore unknown places may, in fact, cure far more of society's ills than government programs and huge dumps of money. Who can argue against the impact on the world's population of having a bright point of light up on the Moon's surface each night where humans work to uncover the mysteries of nature? A place where Earthmen work—not Americans, nor Russians, nor Christians nor Muslims—just Earthmen. What impact will such a sight have on children all over the world?

The one major difference between exploration in space and that on Earth is distance. Everything is just so far away. Yes, the Moon is only three days away, but the next step after that is huge. Using current rockets, a trip to Mars is around six months. Imagine six months trapped in a can. Human psychology will be strained not only because of the confinement, but because of the ever-present knowledge that you simply can't go home—even in a life-or-death emergency. In fact, because of planetary motions, you can't get home for three years. Three years of close quarters, tiresome crewmates, broken equipment, sores from your spacesuit, and the ever-present bombardment by cosmic rays blasting your cells every second.

In the past, adventurous crews explored the Earth in slow-moving ships. Rarely, though, was any vessel at sea very far from land longer than three months. Those hearty adventurers were tough, seasoned sailors, yet they had the advantages of breathing air on deck, of feeling the wind in their faces, and of finding fresh supplies at each port. In space, the crew must carry everything it needs. A three-year mission of this type seems ludicrous to consider.

The answer, of course, is the same answer that has sprung forth throughout history. We simply need to build ships that go faster. Reduce the trip time to a year and a crew can fulfill the mission with a good chance of coming home. Going faster will reduce the risk.

The technology for a new type of rocket that would enable fast missions to outer planets was developed in the 1960s by the Los Alamos Scientific Laboratory. Originally intended for use in ICBMs, rocket engines based on fission energy were designed, built, and tested in the Rover/NERVA programs. In all, over 23 different designs were tested between 1955 and 1971. The performance of the engines was about twice that of the current engines used on the space shuttle. So why weren't these engines used? In 1952, Dr. Werner von Braun and others theorized that humans would be on Mars by the mid-1970s. NERVA rockets could get to the Moon in a day—to Mars in four months. Why aren't we already on the Moon and Mars?

Is it because of the perceived risk of fission energy?

## Perspective

For several decades, the public has



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been told to fear the use of nuclear power. Today at NASA research centers around the US, nuclear is referred to as "the N-word," as if the whole word would bring doom upon the speaker. The public around the world has been indoctrinated to believe that nuclear energy, and radiation in general, is an evil. Yet this is totally untrue. One third of all patients admitted to hospitals in the US receive treatments involving a radioactive agent. Nuclear power in the US has proven to be the cleanest source of energy from an environmental impact perspective—no tons of radioactive ash from coal and no tons of carbon dioxide and other acidic pollutants from oil or gas—just lots of energy from small quantities of material. The energy contained in a kilogram of uranium is equal to that in 40 million kilograms of natural gas. It is this feature of high energy density, i.e. energy per unit mass, that makes nuclear energy the best candidate for propelling the human presence into the Solar System.

Clearly, there is risk associated with using nuclear energy. That's the point, in one respect—have we learned to control a high-energy-density source safely? No one can dispute the impact of Chernobyl. But the lesson to be learned is not to ban nuclear power but to be certain the reactor design is safe. Several countries have proven that good reactor designs are possible. Even Three Mile Island, riddled as it was with human error, still prevented major loss of any radioactivity to the local environment. Nuclear power has proven to be the most reliable and environmentally friendly source of electrical power ever developed. Humanity has, in fact, learned how to control this energy source.

Space is vast—that's all there is to it. Interplanetary distances are on the scale of hundreds of millions of miles. Mars at closest approach is two hundred times farther away than the Moon. Pluto at closest approach to Earth is six billion miles away! Traveling such distances in a reasonable time frame requires high speeds. High speed means high energy. Higher energy content per pound of ship translates directly into a faster trip.

### Technical versus Social

The use of nuclear power in space involves two kinds of issues: technical and social. The social impediments are subjective, emotional, and often ill-informed. Many special interest groups, often claiming to be proenvironment, have established themselves as antinuclear. In most cases, this categorical stance extends to the use of nuclear energy in space. The acceptance of this position by the public has hamstrung the US planetary exploration program. The Cassini probe, launched in 1997, just passed the halfway point to its final destination. Almost forgotten by the public already, the satellite will need seven years to get to Saturn because of the chemical propulsion used in the mission. This is no way to carry out an experiment.

In order for humanity to progress into space, this author believes that we will have to accept the use of high-energy-density sources such as fission. History often characterizes past civilizations by the magnitude of the energies they harnessed—wood fires, coal fires, coke fires, and combustion of oil. Currently, we have reached the end of the chemical energy ladder with the combustion of hydrogen. Very likely, we will be judged by future historians by our ability to accept the challenge and demands presented by the use of nuclear power.

The fears invoked by the perceived risk are unreasonable. According to the WASH 1400 report, the risk of all the nuclear power plants in the US causing ten deaths in a one-year interval is 100,000 times *less* than having ten people killed in an airplane crash. It's even 1000 times less than the chance of ten people dying from dam failures. Letting fear of a technology rule the course of history for a civilization is irrational. We can easily



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imagine early man finding a flaming branch after a lightning storm. Upon returning to his lair to show the new light to his tribe, he accidentally burns his finger, drops the branch and sets fire to skins, bedding and surrounding detritus. The conclusions by the tribe: the flame is bad, evil; put it away; hide in the dark. But those who choose to conquer their fears will progress. Those who run and hide in the dark will not.

Nuclear rockets can be operated cleanly and safely. The waste produced will be held within the material of the core. No radioactivity will enter the Earth's biosphere. With suitably designed shielding, a human crew will receive a radiation dosage rate less than 5% above that occurring naturally on a journey into space. Space is a vacuum but it is not empty. Intense levels of high-energy radiation fill the void. Ironically, therefore, because the trip time would be shorter, the human crew would actually receive a smaller radiation dose on a mission with a nuclear rocket than on a mission with a chemical propulsion system.

**Technical Issues of a Fission Rocket**

From a purely technical standpoint, the fission rocket has inherent advantages. Fundamentally, a nuclear rocket is just a simple heat exchanger, much like the burner on a stove. Uranium particles are mixed into a block of graphite that has many parallel holes passing down the length. Using surrounding control rods, the block is made to produce fission energy which heats it up to very high temperatures. Hydrogen from an external tank flows into the block, through the holes, and is heated to high temperature and pressure. The hydrogen is then exhausted out the nozzle at high speed. There is no "barely contained" explosion as in chemical rockets. In addition, because there is no liquid oxygen tank, the chance of a *Challenger*-type explosion is reduced to near zero.

Either we will eventually overcome the social resistance through education of the public, or we will fail to send humans to nearby planets. The social issues raised by opponents are often shadowy, fluidlike, and hard to succinctly define. The technical issues, though, can be addressed and identified.

**History of the Nuclear Rocket**

In 1955, the Los Alamos Scientific Laboratory began the Rover program to develop a solid core nuclear rocket engine. In 1963, the Nuclear Engine for Rocket Vehicle Applications (NERVA) began with the Aerojet Corporation as the prime contractor and Los Alamos as a supporting contributor. The goal of the NERVA program was to transform the nuclear reactor technology developed by Los Alamos and produce a space-qualified nuclear engine. (See Figure 1.) Both Rover and NERVA were terminated in 1972, when the government decided to cancel any plans for sending humans to Mars. Before termination, however, the Rover/NERVA programs achieved the following:

- built and tested 23 reactors/engines,
- achieved fuel temperatures in excess of 5500 degrees F,
- ran a reactor with a peak power of greater than 4000 megawatts,
- operated a system for over an hour,
- demonstrated multiple start-up and shut-down operations, and
- proved that the graphite-based reactor core could withstand the extreme conditions of operation.

All told, from 1955 to 1971, the US spent around $3.5 billion (1960 dollars) to design, build, and test nuclear rockets. This would be equivalent to around $10 billion today.

The exhaust of the engine in the final days of the program was calculated to have a specific impulse of near 850 seconds, almost three times that of the kerosene engines of the Saturn V and



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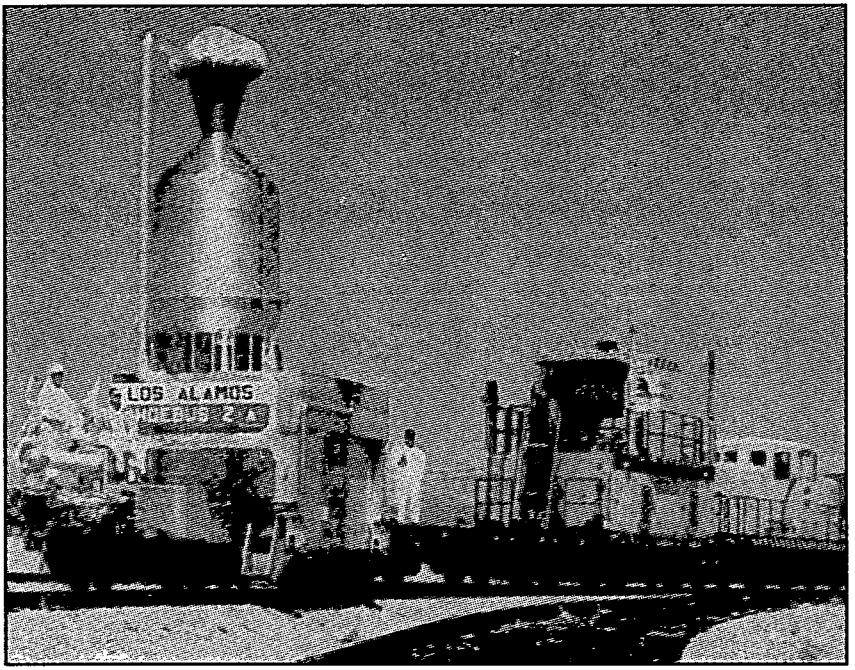


Figure 1. Photograph of the NRX engine being transported to Test Cell C at the Nevada Rocket Development Station at the Nevada Test Site.

twice that of the soon-to-be-developed LOX/hydrogen engines of the Space Shuttle. The impact of this performance, for example, would have been to reduce the round-trip time of a manned Mars mission from the three years possible with chemical engines, to about 14 months.

In 1999, the NASA Marshall Space Flight Center funded the Bechtel-Nevada Corporation and the Los Alamos National Laboratory to examine the idea of testing a nuclear rocket under today's environmental guidelines using a concept called Subsurface Active Filtering of Exhaust (SAFE). This is based on using the highly porous rock strata at the Nevada Test Site to absorb any fission products released during the test of a nuclear rocket. The results of the project showed that the SAFE concept could be proven using a RL10-5A engine for a cost of around $2.5 million. The project further determined that with a $15 million capital layout at the NTS, a nuclear rocket could be tested at full power and full duration for $1.6 million per test.

Recently, NASA convened an independent review panel (including this author) to critique the propulsion elements of their Advanced Space Transportation Program (ASTP). The Marshall Space Flight Center was in charge of pursuing advanced concepts in space propulsion. The panel reviewed 45 propulsion concepts grouped into three categories: 1) Earth to orbit, 2) interplanetary, and 3) beyond the Solar System. In the final report, the panel recognized that "the only near-term concept available for human missions to the planets was "fission technology." The two obstacles to obtaining nuclear systems were fuel devel-



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opment and ground testing. The past three years have shown that the testing issue may have been solved by the SAFE concept. The only remaining obstacle is a suitable fuel. Development of a fission-product-retaining fuel could enable not only human exploration of the planets, but also cheap access to orbit.

## Future Possibilities

"The potential for the future [in space] seems limitless. However, without affordable and reliable access to space, this potential will remain unrealized."

—Daniel S. Goldin, NASA Administrator, testimony before the Senate Subcommittee on Science, Technology, and Space, 1998.

### Cheap Access to Space

The potential benefits of fission propulsion to space exploration are tremendous from the purely technical perspective. Currently, launch to orbit costs NASA over $4 billion per year, the US Department of Defense $1.5 billion per year, and the commercial market worldwide over $3 billion per year. Thus, the total price for launch services is almost $9 billion. Reduction in launch costs is expected to result in tremendous market growth.

Currently, Delta II-class rockets launch satellites at around $4000-$5,000 per pound of payload. Launch on a Titan IV-class rocket will cost around $9000 per pound. As satellite bandwidth requirements continue to increase, the satellites are expected to increase in size, mass, and power requirements. These payloads will tend to require higher launch-mass capabilities. If the cost of launching a satellite on a Titan were reduced to $1000 per pound or less, a significant increase in launch demand would result. To accomplish this, a propulsion system with a significantly higher specific impulse must be developed.

Millions of dollars and thousands of people-hours have been spent in pursuit of reduced cost-to-orbit. NASA has investigated several single-stage-to-orbit (SSTO) designs; new start-up companies have pursued wildly different, innovative concepts; and the major aerospace contractors have tried to reduce costs by streamlining operations. All of these efforts have, so far, failed. They have all suffered from one major shortcoming—the low energy density of chemical propellants.

If the goal for the cost-per-pound-of-payload, denoted by $\varepsilon$, into orbit is $500, then the total capital intake by a launch company will depend on the mass of the payload. For example, a 1000-lb payload would bring in $500,000. However, the mass of the entire rocket on the launch pad is also dictated by the payload mass. Thus, the maximum allowable *cost per pound of rocket on the pad*, denoted by K, can be calculated for a given specific impulse (Isp) and a given $\varepsilon$. The results of a preliminary calculation are shown in Figure 2. The figure shows that in order to develop an economically competitive SSTO, one of two approaches must be developed: 1) very cheap fabrication/operation of chemical rockets or 2) a rocket with a significantly greater specific impulse, measured in (s)econds.

Currently, the Delta II costs $55 million and weighs 510,114 lbs. on the pad, or $108/lb-on-the-pad. In order to achieve a cost of $500/lb-payload, a Delta would have to be placed on the pad for around $5/lb-on-the-pad. But the liquid hydrogen alone costs $15/lb. Because the technologies these vehicles use for pumping hydrogen are very similar to the nuclear rocket requirements, these values can be used to set the scale for a nuclear system. The curves in Figure 2 show that for K equal to $108/lb, the Isp of a nuclear rocket need only be 800 s to deliver a payload to orbit with an $\varepsilon$ equal to $500/lb. But the nuclear rockets tested during the 1960s had an Isp of 850 s. Because of improvements in materials technology in the past few



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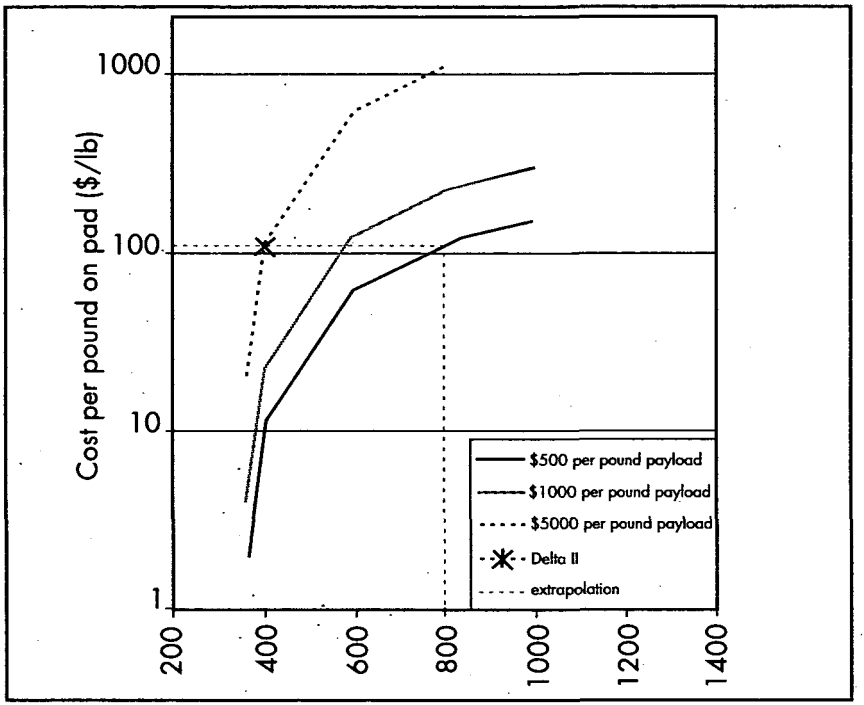


Figure 2. The plot of the maximum allowable cost to put a SSTO rocket on the pad, K, versus specific impulse. The plots are shown for different values of the parameter ε - cost per pound payload. The current cost for a Delta II is also shown. Extrapolation of the Delta costs to the line for ε = $500/lb-payload shows that a rocket would need a Isp = 800 s.

decades, more recent estimates indicate that a nuclear rocket could have an Isp of between 900 s and 1000 s.

Because the nuclear rocket has an Isp almost twice that of the LOX/LH2 engines, the payload can be put into orbit for the lower cost even though the total cost of the rocket on the pad may be higher. Thus, a nuclear system should be able to put payloads into orbit for around $500/lb using technologies currently employed in a Delta-class rocket.

Nuclear rockets are a proven technology. The fuel that powered the early versions, however, allowed radioactivity to seep into the exhaust stream and, thus, prevented any application of the rocket in the atmosphere. Even in today's environment, a nuclear rocket can be tested and validated for modest cost. The high performance of a nuclear system will allow a significant reduction in cost to launch payloads into low Earth orbit. To be acceptable for use, however, the rocket must not allow any radioactivity to the exhaust stream. By utilizing advanced fabrication techniques, a fuel form can be produced that will inhibit the migration of fission products. Consequently, all fission products can be interred in the fuel matrix. Since neutrons do not induce radioactivity in hydrogen, a clean exhaust of hydrogen gas can be produced. Demonstration of this capability could enable a new, robust, high-performance launch capability to be developed.

At first the risks implied from launch-


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ing a nuclear rocket off the surface of the Earth would seem too great to even consider. What if it blows up at launch? What if it explodes over a city? The simple fact is that a nuclear system has much less chance of explosion than the shuttle. The nuclear system has no combustion chamber. No oxygen tanks rest near hydrogen tanks or near jets of hot gases. In addition, no nuclear rocket tested in the 60s ever had a breach of the pressure vessel. The operating pressure of one thousand psi requires a very thick containment vessel. In the event of a launch abort, only a single entity would return to the surface—not a cloud of radioactive debris.

Would the engine be radioactive? Certainly during operation, radiation levels would be high. However, the standard standoff distance applied at any rocket launch will be sufficient to protect any observers. Is the engine radioactive after operation? Yes, the core will continue to emit gamma rays for several months. However, these are largely shielded by the pressure vessel and the surrounding material. During the ten-minute burn required to reach orbit, a nuclear engine will create only 27 grams of fission products—the mass of a few paperclips. Most of the fission products are very short-lived. Even if the engine did return to Earth after a launch abort, workers could handle the unit safely.

The idea of using a fission-based system to launch material into orbit seems, at first, to be nonsensical. From a technical perspective only, though, it may be the most feasible method to achieve low cost to orbit. The subjective public perspective, however, would have to alter dramatically to enable such a system to be built.

### Sending Humans into the Solar System

Several studies over the past decade have identified the difficulties of sending manned missions beyond the Moon. Most prominent of these are the radiation levels of nearly a REM per week (a typical chest x-ray is around 0.03 REM) from galactic cosmic rays and the substantial decalcification of bone that occurs in a zero-gravity environment. In addition, psychological problems associated with living in confined quarters for long periods of time have been indicated by incidents on board the Russian space station, MIR. The effects of all of these threats can be reduced substantially by reducing the total mission time *to six to ten months*. Alternatively, if the mission scenario allows for return in a previously deployed ship, missions with a *40-day transit each way* could be considered. To accomplish this and maintain a reasonable mass fraction for the Initial Mass in Low Earth Orbit (IMLEO) of the ship, a high-thrust system with a specific impulse of nearly 3000 seconds will be required. The gas-core fission rocket (GCNR) is the most likely candidate to achieve this performance in the near future.

Because of the high specific impulse afforded by the GCNR, all-propulsive, high Delta-V missions can be considered. This will provide the crew an active means to adjust to unforeseen events whereas passive concepts like aerobraking may be more susceptible to unknown developments such as a fluctuating Martian atmosphere. Thus, all-propulsive missions may reduce the risk of the mission. In addition, the increased performance allows extra shielding against the space radiation environment to be incorporated into the transfer module without a significant increase in the total ship mass in orbit.

### GCNR Technology

Simultaneous with the Rover/NERVA programs in the 1960s, the gas core concept was also experimentally investigated. The erosion and the temperature limitations of the graphite fuel experienced by the solid-core nuclear rocket led several researchers to theorize on the feasibility of having a nonsolid, or



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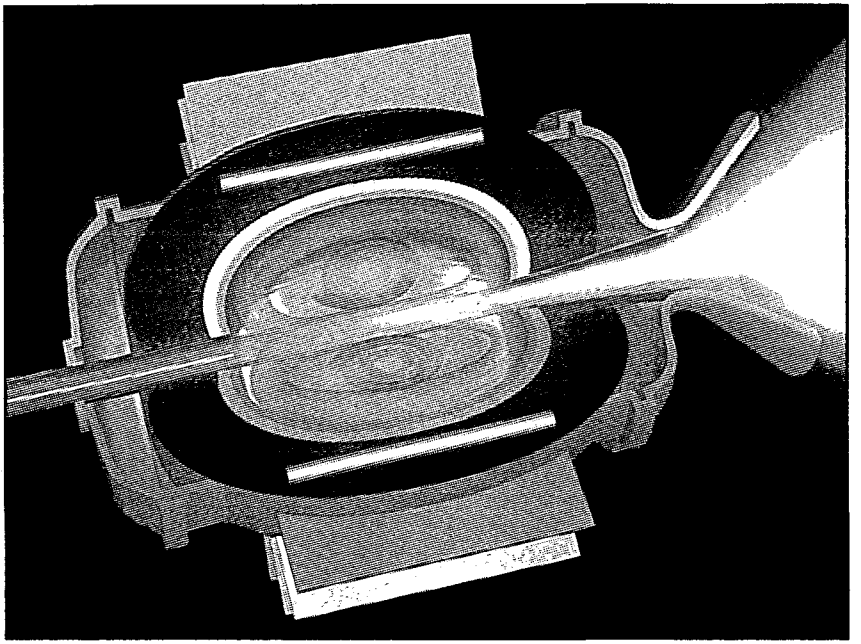

Figure 3. Artist concept showing the flow configuration of a potential gas core nuclear rocket. Conceivably, the engine could have a specific impulse of over 3000 s.

gaseous core.

A gaseous core would allow far higher temperatures to be achieved and, thus, far higher performance by the rocket. Specific impulses of several thousand seconds were seen as possible. Consequently, experiments in vortex formation, plasma stability, uranium-plasma emissivity, hydrogen opacity, and gas-phase criticality were done to determine feasibility. The effort, however, was limited to an empirical experimental program because of the lack of computational capabilities at the time. With plasma dynamics in its infancy, accurate assessment of the chaotic, complex behavior of a fluid-stabilized plasmoid was unreachable.

In the 40 years since the Rover program, hundreds of millions of dollars have been spent in plasma research and in developing powerful computational modeling capabilities. The most notable efforts in these areas were the fusion energy programs and the nuclear weapons programs. Both of these large programs relied heavily upon benchmarked computational models to examine stability, operations, and technical feasibility prior to executing expensive experiments. Similarly, the concept of a gas-core nuclear reactor can now be examined computationally before large, expensive and hazardous test facilities must be constructed.

In 1996, the NASA Marshall Space Flight Center funded a small effort to seriously assess the feasibility of the gas-core concept using the computational tools and expertise at Los Alamos. As a result of the Los Alamos effort, a new geometric configuration for a gas-core rocket has been formulated and is shown in Figure 3. A high-speed jet of


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gas is injected axially into the reaction chamber. As the jet expands across the chamber, some of the gas will exit through the nozzle but some will be recirculated along the outer wall. The recirculation creates a toroidal vortex. In a nuclear system, uranium is injected into the vortex. Driving the uranium to criticality will heat the gas along the axis to extreme temperatures providing a very high-specific-impulse thrust. This configuration has the advantages of having the highest heat flux be at the centerline of the hydrogen flow stream, of having a thick hydrogen barrier around the walls, and of not suffering the uranium-migration loss mechanism.

There is little doubt that a gas-core reactor can be built in a stable configuration and driven critical to produce substantial power and thrust. The questions of final performance with regard to fuel-loss rate, specific impulse, and mass will depend upon the integration of many factors into the final design and must be experimentally investigated. This is the next step.

Sending a human crew to Mars will be risky and substantially more demanding than the Apollo missions. However, the primary risk factors of radiation exposure and physiological degradation can be alleviated by performing fast round-trip missions of months instead of years. The Gas Core Nuclear Rocket offers that potential if it can be successfully developed. Potentially, the rocket could allow a three-month transit to Mars, a sixty-day stay at the planet, and a four-month transit back to Earth. The ship would contain shielding against space radiation, three landers for visiting the Mars surface, and a crew of six—all for an initial mass in Low Earth Orbit that is less than that of the three-year-long NASA Design Reference Mission, circa 1998. The ability to propulsively brake at the planets and to shield the crew against the radiation makes the GCNR mission one worth pursuing.

From the inception of this project, the complexities and difficulties inherent in the GCNR concept have been recognized. This is a hard problem. It is a grand challenge that, if met, can lead humanity out into the Solar System.

## Summary

If the human race is to expand into the Solar System, it will have to face head-on the problem of traveling huge distances in a short time. This requirement translates into a need for high-energy-density propulsion systems. Fission is the only such system that has been tested and has sufficient performance to enable humanity's expansion.

Two obstacles may impede the development of fission propulsion—sociopolitical and technical. A vocal minority over the past few decades has convinced the general public that fission systems are inherently bad despite the overwhelming evidence that fission systems are the cleanest and most reliable form of power generation. In order to explore space, the public must be educated that the use of fission energy will reduce the risk to human crews, will reduce the overall radiation exposure to the crew, will shorten mission duration, and will dramatically increase the chances of a successful mission.

Fission propulsion is a proven technology. Fission rockets can be tested on the ground safely and relatively cheaply with no exposure to the environment. On the launch pad or prior to operation, a fission rocket will produce 1 million times less radiation than that generated by the Cassini probe launched in 1997. In space, operation of the nuclear rocket will not impact the already high levels of radiation present nor will it be a source of radioactivity to the Earth.

Propulsion is the key to space exploration. Nuclear systems are the best, most practical, highest-performance, near-term option and should be given a fair evaluation without the hindrance of



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the "N-word" bias. Over the years since the NERVA program, new technologies in materials, in testing, and in reactor concepts have been developed. Combined, these new approaches could enable the safe, clean use of fission propulsion to explore the cosmos. Space exploration is not only the greatest challenge this country can undertake but could possibly be one of the greatest contributors to peaceful coexistence on this planet. But to do exploration, we need high-performance propulsion. A compact, safe, testable fission rocket can provide that capability.

A nuclear rocket will enable humanity's first real step to the stars. ■

* * *

**About the author:**
Dr. Steven D. Howe worked at the Los Alamos National Laboratory for over twenty years in the areas of nuclear weapons physics, antimatter physics, hypervelocity intercept, nuclear propulsion, and advanced space technology. In addition to over fifty technical papers published worldwide, he is a published SF author and has appeared in numerous television programs about space and rocketry. Currently, Dr. Howe is the CEO of Hbar Technologies, LLC, a new start-up company developing commercial uses for antimatter. Information on these and other technologies can be found at Dr. Howe's site at http://www.cybermesa.com/~mrpbar/ steve.html

What is a cynic? A man who knows the price of everything and the value of nothing.

—Oscar Wilde

The surest way to corrupt a youth is to instruct him to hold in higher esteem those who think alike than those who think differently.

—Friedrich Nietzsche



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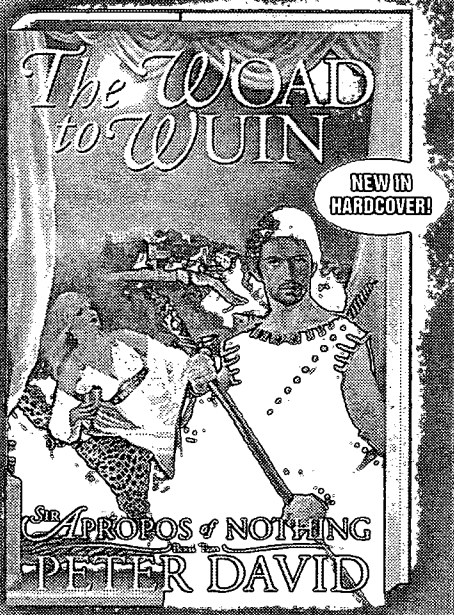
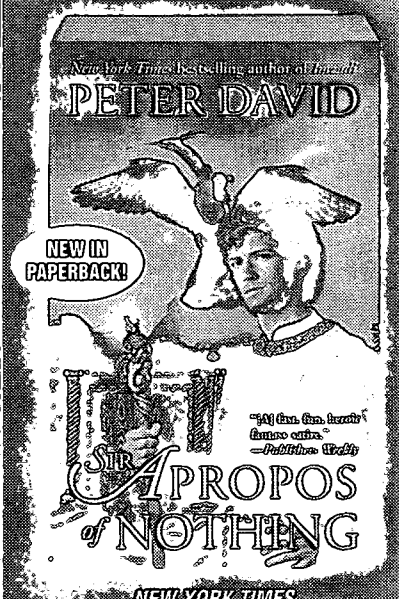
From the *New York Times* bestselling author of *Imzadi*

Meet Apropos: rogue, rascal, scoundrel, all-around cheat...and those are his good points. Only trouble (from his point of view, actually) is that he just might be a hero foretold by prophecy, in these delightfully skewed versions of classic, mythic adventures where knaves become legend and fantasy as we know it is brilliantly turned upside-down.

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# Mammoth Dawn

Kevin J. Anderson
and Gregory Benford

Illustration by Nicholas Jainschigg

Some causes fire emotions so extreme that those who hold them can look like self-caricatures—but underestimating them is dangerous.

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If only the protesters' intellect matched their verbal cleverness, Alex thought, the Helyx Corporation wouldn't have any problems at the gate.

*It's Not Nice to Fool with Mother Nature!* said one of the waving signs displayed on a securitycam window projected on the surface of his desk. The usual. Alex Pierce had stopped trying to understand the Evos' odd point of view, had ceased even being bemused by their antics. He had a company to run.

He relegated the securitycam image to the background and brought more important documents forward. Datascreens and e-mail lists cluttered his table-sized desktop screen as much as memos and paper messages had once done.

Earlier that morning he'd woken up in Miami with a hangover. He'd downed three drinks too many at yet another fancy fund-raiser dinner—this one to preempt birth defects through parental genetic screening. Before midday he had choppered back to the main lab administration offices in rural Montana. For a worldwide corporation, business hours lasted all day long, and it was always time for the boss to get back to work.

His wife Susan had stayed home on the ranch. She disliked black-tie functions like the one in Miami, though she could be devastating in a cocktail dress, the barest breath of jewels implying wealth far better than gaudiness did. But too often the diplomats and VIPs treated Alex as the only important face in the room, and Susan the gorgeous trophy wife rather than a talented scientist in her own right. She hated the attitude, and Alex had made appropriate excuses for her.

But Susan's real reason was that she wanted to stay with her mammoths.

As his company had grown from a fledgling startup with one biotech product—a symbiotic microorganism that could fend off strange *E. coli* in the human digestive system—to a corporate leviathan that spent most of its resources just figuring out how to receive and manage the enormous profits, Alex had learned to multiprocess. While taking care of corporate details, answering vidmessages, and delegating responsibilities, a calm and meditative part of his mind was anticipating an evening of campfires and peace with his wife, out near the herd. . . .

"We got another fence-jumper," Ralph Duncan said on the secure phone, interrupting a dozen separate trains of thought and delivering a problem of his own. "Got him cold."

Alex's autosecretary instantly knew this was important, captured the call and transferred the security man's weathered image to the upper corner of the desk. "Remember that li'l hint we got on the acoustics? Tracked him in the woods up along the eastern ridgeline. Ambitious bastard."

Alex was glad to be interrupted from pharmaceutical statistics, Third World traveler health records—dull, even if they did point to continued success. "Another Evo type?"

"They don't carry some kinda ideology tag, Boss, but you can bet he was trying to get a look at the mammoths. Should I tell the sheriff?"

"No, he'll just process the guy, slap him on the wrist, and let him back out to cause more mischief." Alex rubbed his fingers over thin lips. "Usually only the hardcore ones try to get past the fences. How's he outfitted?"

"Pretty fancy. Overnight gear, one of those microbags for sleepin', videocam with closeup fittings. Five kilometers inside the fence, easy. No question about boundaries and jurisdictions." Ralph snorted.

By now, the questions came automatically to Alex. The ranch often had intruders. "No weapon?"

"Nope. Except for tryin' to run at first, gave us no trouble."

As he dealt with the conversation, Alex finished some routine computer



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work, forwarded several inquiries to Susan's mailbox, bumped a set of interview questions to his PR squad (who knew all the right answers anyway), and keyed out, using his thumbprint to secure. At no point did Ralph ever notice that he didn't have Alex's full attention.

"If you ask me, this guy wanted to be caught. Claims he knows you professionally." Ralph's sun-grizzled face showed just a hint of amusement. "His ID says Geoffrey Kinsman."

Now Alex paid attention. "Damn! I think I know him. Spelled with a G?"

"Yep."

"What's a good biologist doing with that bunch of Luddites?"

"Says he'll talk only to you, Boss."

Alex shut down the other operations in the office, signaling all his staff distributed around the world that he was not presently available. "Bring him to the hospital, not here."

Ralph had an intuitive sense of Alex's moods, born of a decade's close collaboration. But now the security man seemed surprised. "Show and tell, Boss? For one of those clowns?"

"The Evos are always more afraid of what they imagine than what they actually see." He put on a pair of spex and tested the uplink as he headed out of the office, his boots clomping down the varnished wooden stairs, and out onto the plank porch. "Stall him for five, Ralph. Give me time to profile him."

When Helyx had purchased an isolated chunk of northern Montana, Alex kept the original ranch buildings, letting them fade and weather from bleached white to an ash gray like raw silver. The primary genetics labs were in the old pine-log barn, which Susan had dubbed the Pleistocene Hospital.

"Full database search," he subvocalized into the spex as he walked. "Summarize relevant information on Dr. Geoffrey Kinsman. Reference point: He was in my lab around fifteen years ago. Apply context filters."

With a big drive-in bay and concealed windows, the hospital barn looked like an equipment garage. Inside, the crisp antiseptic air mixed with the moist organic odors of feathers and fur, droppings and feed—a contrast to the smelly oil drums just outside on the loading dock.

Lounging in his jeans against the split rail that bounded the old barn, Alex read a data summary that scrolled across the spex. All he needed to know about Geoffrey Kinsman: a man with just a bit too much clout and education to dismiss as simply a misled Luddite, as Alex had always considered the Evos to be.

For years, Kinsman had associated with political activists, starting with *Ruckus Society* training camps, where bright-eyed kids learned street protest tactics. His molecular biology research had produced over a hundred papers, recently with an angle toward genetics and species preservation. Another "clean genes" guy. Unarmed, a routine lab type, Kinsman did not seem dangerous. Maybe that didn't include the threat of being bored to death.

Alex bit his lip in annoyance. He wished they had a network of sympathetic locals who would warn Helyx before a guy got this far in. He had endured the backwoods suspicions, had expected them because he'd grown up just over the Idaho border. For the first few years, the locals had given him a narrow-eyed appraisal. In fact, for a while an ugly rumor had spread that he was here to recruit locals as organ donors for sinister Helyx experiments.

But when his staff offered only day work and some well-paid farmhand jobs, the people were disappointed—until the area economy picked up and kept growing. Within a year Alex Pierce could walk into any bar and get his beer paid for, because Helyx Ranch pumped in a goodly share of the county's revenue.

Alex pursed his lips, pondering. A lot of the locals might agree with the protester's views, even help them out a lit-



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tle. A bitter truth—he hadn't won the war of ideas even here, in home country. He knew these people, shared many of their gut responses. But he had not lived in their world, really lived in it, for a good long while. Ralph was the real thing—and looked it in his rough pants and boots as he came through the door with his captive.

The man walking next to him was a dapper, compact item, fresh from an upscale outfitter: olive green Goretex jacket, trim all-weather leggings, a big hiker's watch with a global positioning readout. He looked as out of place as a chicken in church. A bit heavier than Alex remembered, but the tight mouth was the same.

Geoffrey Kinsman's voice was as hard and flat as a stove lid. "Dr. Pierce." East Coast accent, mid-Atlantic state. He held out a hand, and Alex ignored it. "You don't remember me?"

"I remember. Just read the data squirt about you, Dr. Kinsman. All the good stuff." He decided to have some fun with him. "You seem to have strayed a bit out of your way."

"Might as well admit the obvious," Ralph growled, playing the tough cop. "You wanted to create some disturbance—give the Feds a pretext to come in here."

Kinsman glanced at the old security chief as if he were some kind of lab specimen. "You overestimate my powers."

"That's just what you did at that animal experimentation facility outside Topeka, five years ago," Alex said. It sometimes put these people off balance if you could demonstrate up front that you knew all about them.

But Kinsman didn't even blink. "That was coincidence."

Ralph snorted, and Alex grinned. Kinsman was not going to be any trouble, he judged; he didn't even have a cover story. "We'll be fine, Ralph. Thank you." As the security man turned to leave, Alex scowled back at Kinsman. "So why, exactly, was it so important to break through my fences and trespass on my private property?"

The man allowed himself a small, dry chuckle, but his eyes were a brittle gray, like chips of slate, as he said, "To talk some sense into you. I consider that constructive, not destructive."

"Sense? Those people at the South Gate have an excuse: they're ignorant. But we worked together, so I thought—"

"You didn't think twice about me when you published that paper, the one on mammoth genes."

"Right, you did some of the preliminary scans on the gene lines. A grad student for two years, then left."

Kinsman took on a self-righteous air. "I disagreed with the work, once I understood what you were doing."

"So what was your gripe? Was it because I 'didn't think twice' about you?"

"Neither of you even asked if I wanted my name on that paper."

Alex shook his head. "You were doing straightforward stuff. Not original. Sorry if we didn't acknowledge you—" He couldn't even remember for sure.

"Oh, there was a paragraph at the end, thanking me and a dozen others, sure."

Alex smiled slightly. "You wanted to be on the paper. Is that what this is about?"

"No, damn it!" But Kinsman's flushed face belied his words. "I just thought you'd listen to me because I was a lab grunt for you once. Maybe your money has insulated you from the arguments against this entire—"

Alex held up a hand, quick and decisive. "Already heard them. Before I took you on as a grad student, I had invented most of the arguments. Or my wife had. But we thought it through. Decided for ourselves."

Kinsman blinked, looking taken aback at Alex's bluntness. He must have had plenty of time to rehearse this confrontation while backpacking across Helyx wilderness property, Alex mused,



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but a lot of emotion churned in his face. There had been a lot of grad students in Alex's lab then, most of them doing routine tasks to get experience. Somehow this one had left little impression on him. But clearly that old, simple paper had been a big deal to Kinsman. Students normally didn't get their names on technical papers unless they did something creative, but Kinsman had apparently taken that irritating grain of sand and turned it into this pearl of a grudge. Alex had never been really good at judging people, but his years leading a stupendously successful company had sharpened what little skill he naturally had.

Nothing brings enemies out of the woodwork more effectively than success.

"Okay, let me talk some sense into *you*." Alex gestured toward the old oaks that towered near the barn and the ranch buildings. The immense, gnarled trees were majestic and stately—and full of birds. "Look over there, Dr. Kinsman. Beautiful birds, graceful. You should see them fly at sunset, like a cloud." Even without squinting, he could pick out a dozen nests in the branches, and the constant shifting, cooing, fluttering made the branches tremble.

"I didn't come here to look at birds, *Dr.* Pierce." He spat out the title.

Alex turned to him sharply. "You should. Once, they blackened the skies, billions of them in North America when Columbus landed. But it was in their nature to nest in huge colonies, only in big stands of oaks or beeches, which made them easy prey. Over the centuries settlers cut down the oaks and beeches for firewood and lumber, or just to clear farmland. Hunters shot millions of those birds, usually for sport, though they shipped the carcasses to the cities by the barrelful."

Kinsman looked impatient, then startled. "Those are—"

"Passenger pigeons lay only one egg each spring. They couldn't possibly reproduce faster than they were slaughtered. It was genocide, pure and simple, *Dr.* Kinsman, perpetrated by human beings. The last passenger pigeon died in 1914 in the Cincinnati Zoo, and the species was extinct in a historical blink of an eye. Until Helyx brought them back." Alex couldn't keep the happy pride out of his voice.

Kinsman, though, looked disgusted to the point of being ill. "Extinction is Nature's way, Pierce—for whatever reason. You can congratulate yourself for your genetic breakthroughs, but can you honestly say the world is a better place because you have brought back a . . . pigeon?" He waved dismissively toward the oaks. As if at a signal, several of the birds took flight, ruby-throated, with lovely gray body feathers and long pointed tails. "Your means are dangerous, and your ends are utterly inconsequential. Pigeons!" The fire in Kinsman's eyes made Alex reconsider the wisdom of having sent his security chief away so quickly. "You're a bigshot businessman—what possible market can there be for passenger pigeons? For zoos? Pets? *Meat?*"

"Market talk is what I feed the board, but that doesn't even start to explain why I'm here." He allowed a small, self-deprecating smile. "I didn't want to go down in history as Dr. Diarrhea." Alex turned from the split-rail fence. "Come have a look. Maybe we can use a crowbar to open your mind."

Inside, the lab was a mix of cool high-tech surfaces and ancient woods, the barn's past never wholly banished. Consoles and elaborate digital diagnostics stood next to old feed cabinets, still useful for storage. High spotlights gave the scene an evenly-lighted patina and crisp, conditioned air fought the old horsy smells and new disinfectants. Chrome countertops sat next to wooden fences and thick wire-mesh cages.

"Not many people get to see this, Dr. Kinsman," Alex said.

"Not many people should."

*Why do I try?* he thought. *If Kinsman*



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*wasn't a colleague . . .*

Inside a shoulder-high pen stood two gawky-looking birds, like giant chickens with stretched necks. They had mottled brown feathers, lizardlike feet, and towered nearly ten feet tall.

"This is our first mating pair of moas, a New Zealand bird that went extinct sometime in the 1600s." Elated notes crept into Alex's voice, but he saw no wonder in Kinsman's eyes. "We're currently in our third-generation retrograde development of the Tasmanian tiger, too. But the lack of a close sibling-species as well as general difficulties in dealing with the marsupial gestation process has caused some delays."

He glanced toward the set of thick doors and reinforced windows at the back of the Pleistocene Hospital. Kinsman looked suspiciously at the closed-off rooms . . . but Alex didn't think the man was ready for that sight yet. "Other resurrected animals," he explained with an offhanded comment. "Look, I don't have time to show you everything. It's obvious you're more interested in proselytizing than in science."

A rotund bird higher than a man's knee waddled across the floor, looking comical, its black beak blunt and ugly, its eyes innocent. Two stubby wings betrayed the flightless nature of the bird, which moved at a rapid, though ungainly clip. A tufted curlicue of feathers poked up like a pigtail from its rear. The bird prodded around in corners, pecked at imaginary insects, as if it had forgotten where its food dish was.

This time Kinsman stared. "*Dodos*, too?" The dapper man leaned forward and took out his pen, pointing it at Alex as if it were a symphony conductor's baton. "Where will you stop, Pierce? Do you intend to bring back smallpox as well? Or any number of vermin the world is better off without? Have you no respect for the natural order?"

Alex picked up the ungainly bird and carried it squawking to a bowl of grain. The dodo immediately forgot its annoyance and began to gobble the corn. "These birds lived quite nicely on the island of Mauritius until European sailors came and killed them for food. That wasn't so bad, but the sailors also let loose dogs, rats, and hogs, which ate the dodo's eggs. It took only a century or two for the entire species to be wiped out." He scratched the feathers on the turkey-sized bird. "What, exactly, is *natural* about that?"

Kinsman directed a condescending look at Alex Pierce—who captained a gigantic corporation, who had developed a cure for the digestive misery of billions—as if he were an ill-educated child. "You can't possibly predict the long-term consequences of your tampering. Forced breeding, gene-selection, wombs implanted with embryos they were never meant to carry. Why must you *push* things so much?"

"Because I don't have time to waste," Alex said mildly. "Evolution can meander all it likes. We have calendars."

Kinsman sniffed, clicked his pen twice in a nervous gesture. "Mankind is part of the natural order, Pierce, the dominant species on Earth, while other species failed along the way."

"Sometimes with a little help from us. What's wrong with rectifying that?"

Kinsman tossed his pen onto a cluttered desk and actually clasped his hands together in a melodramatic beseeching gesture. "What makes extinction caused by human interference so different from extinction due to, say, a huge asteroid impact? Will you try to bring back dinosaurs next?" He scoffed. "Or woolly *mammoths?* I've heard what you have back in your valleys."

Alex maintained a noncommittal expression. "Rumors."

"Satellite photos."

Alex didn't respond, trying to hide his surprise that Kinsman and his protesters could have gotten such high-resolution images from the Feds.

Kinsman pressed his advantage. "I want to see them, Pierce."



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Blocked from view by a thick stand of Ponderosa pines, the corral had once been used for breaking horses. But Helyx had reinforced the fences, added motion detectors and voltage zappers, and made the barricades much taller. As needed.

Inside the enclosure, Susan studied two of the first-generation hybrids, giving each one a standard monthly physical exam. Maybe Kinsman would be satisfied with this.

When she saw her husband pass through the double gate, Susan's face lit up. They had spoken via earlink after he'd arrived back from Miami, but both of them had been too absorbed with ranch duties to see each other before now. They would have plenty of time tonight, camping out under the stars, back where no one could find them. . . .

Susan rang the old notes in him with a little breath, a flash of a smile. He had called those eyes "molasses brown," because when he looked into them, he felt stuck and never wanted to look away. High cheekbones, luxuriant brown hair, a delicious set of curves artfully set off in a blue blouse atop trim black jeans. She greeted Alex with a broad smile, but when she saw Kinsman follow him into the corral, she immediately adopted a more businesslike expression.

"Susan, this is Geoffrey Kinsman. Remember, he was a grad student back—"

"Oh yes. And now a member of our loyal opposition." Her voice was neutral, neither friendly nor antagonistic.

"I came to see your mammoths. I didn't know whether I could believe the appalling—"

Susan immediately clued in with just a glance at her husband. "Actually, these are 'mammophants.' Just a first-generation hybrid, still far from being an actual mammoth, Mr. Kinsman."

"Please, it's *Dr.* Kinsman. I got my degree at—"

"This one is Short Stuff," she continued without the slightest hesitation and stepped close to the oldest of the mixed-breeds, a docile gray-haired beast with rumpled skin and big eyes, a trunk shortened to a few feet, and no tail. "We used mammoth DNA from Siberia, inserted it into a female elephant's egg, and let the mother bring the baby to term with a lot of uterine monitoring."

Playfully, Susan reached up and slapped Short Stuff's rump, and the tall beast ambled a few feet, then stopped to munch from a pile of sage-green hay piled near a corrugated water trough. "And she's a sweetie."

Alex knew the details, had lived with them for a decade. Short Stuff was not a pure mammoth because she had spent twenty-two months in an Asian elephant's womb, sharing the chemical and hormonal bath evolved for elephants alone. But the womb had proved similar enough to a mammoth's, or the hybrid would have spontaneously aborted.

"We're learning the hard way that there's a critical conversation between the genes and the womb," Susan said. "Call it feminine knowledge. So we're still working to get the right dialog between the mammoth genes and the wombs of each new generation."

Indeed, Short Stuff's womb had turned out to be a much better approximation, and using the sperm of the first male, Middle Man, their offspring was even closer.

"You can sure see the original elephant genes showing through." Susan lifted Short Stuff's leathery left ear, as big as a blanket. "No woolly mammoth had this large an ear. It would lose too much heat in an Ice Age climate. Most of Short Stuff's body was designed for the tropics—she's got a hide that stands up under strong sun. Still, you can see the beginnings of hair, an extra coat to keep her warm. A step in the right direction."

She talked faster as Kinsman's frowning displeasure became more obvious. Susan moved to the other big animal in the corral, the first hybrid male. He snorted, curled his trunk, but she fear-



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lessly thrust a hand into the sparse pelt beneath the massive mouth to reveal stubby, gray-brown shafts. "See Middle Man's tusks? Pretty short for now, but they'll grow longer than any elephant's."

Susan rubbed her hands along Middle Man's midsection, eliciting a pleased sort of grunt.

Kinsman ground his teeth—the first time Alex had ever seen anyone do that, outside of movies. "And what is the point of this nonsense animal? The pure species died out long ago, and your interbreeding process creates only a succession of patchwork monstrosities."

Susan gave him her patented I-don't-suffer-fools-gladly expression. "Exactly. Did you think species just jumped in one shot to a completely different form? That's why it's called *evolution*."

Kinsman eyed the two hairy elephants in the corral. "Evolution didn't make these forms—"

"Right. We did," Susan shot back. "Unlike evolution, we have a goal. Short Stuff and Middle Man are investments for the next generation."

Alex smiled; his wife was a better debater than he could ever be. And she wasn't giving away anything technical, either, trying to swamp Kinsman with pizzazz. He did not need to know how far the plan had already progressed.

Mammoth DNA was a heritage that belonged to all humanity—paid for with private money, part of the fortune Alex had earned as 'Dr. Diarrhea.' Early on, before he'd learned to keep quiet about Helyx's activities here, he and Susan had published a joint paper—the one Kinsman had done some routine lab work on—showing that the difference between elephants and mammoths was only a few dozen critical loci. The media speculation *that* provoked taught them to keep their work quiet. Every journalist could see the potential, write a quick deep-think piece. But making the project happen was a career.

"You frighten me," Kinsman said, looking from Susan to Alex. "Both of you. Our environment is a vast and complicated system that adapts to changes through delicate checks and balances. Dodos and passenger pigeons and moas—and, yes, mammoths—were removed from Earth's equation long ago, and your meddling may well throw everything out of balance again."

"That's an awfully sophisticated argument for a bunch of protesters who usually can't come up with anything more pithy than 'It's not nice to fool with Mother Nature.'"

Kinsman dismissed his cohorts down at the South Gate. "They're just afraid of genetic engineering on general principles. They don't need any deeper argument than that."

"No, I don't suppose they do. People like that have always used their ignorance as a weapon." *And often it turned to violence.*

Kinsman backed toward the gate, as if afraid to get any closer to the gentle hybrids. "Your work is immoral, even aside from the ethical issues. Introducing a big grazer into lands that cows and sheep have already depleted is sure to have a major impact on the environment."

"Helyx's track record speaks for itself. We're concerned about the environment—and it isn't just corporate bullshit either," Alex said with a sigh. Whatever hope he had harbored that a real biologist would be open to rational ideas faded as Kinsman's sour scowl deepened.

As a last shot, the man said, "You have to know that a lot of us in this world think what you're doing here is, at the very least, ugly." He flicked a disapproving glance at the furry mammophants wandering around the enclosure.

Alex could tell the discussion was over, and he knew Susan was already close to losing her cool. "I could tell you things—*ugly* things—that'd make your ears curl up in self-defense."

He remembered news images dating all the way back to the late twentieth century: Eco-terrorists burning fields of modified rice that would have grown in



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the alkaline soil and brackish water of the poorest Third World countries. Or ripping up experimental plantings of frost-resistant strawberries, like children throwing a tantrum. Later, assassinating a researcher who was developing a protozoan symbiote that would have enabled starving populations to break down cellulose and digest some forms of grass.

And if they were caught afterward, the violent protesters always seemed smug and self-justified! Thick-headed fools . . .

All of those things would have helped the human population, fed millions, improved the quality of life worldwide. And yet the rowdy rabble felt they were in a better position to decide what was best for the world than all the blue-ribbon panels of experts and all the United Nations committees. Yes, indeed, they sure seemed to have the best interests of humanity uppermost in their minds.

He pointedly nudged Kinsman through the gates of the corral before Susan could lash out at him, then used the direct-connect uplink in his spex to summon Ralph and a Security escort. "It's time for you to go. You've had your say . . . I just wish you'd had your 'listen.'"

When they emerged from the dense pines around the corral, Ralph was already there to take him away.

It wasn't until later that Alex discovered Kinsman had left his pen behind inside the Pleistocene Hospital. Rather than hurrying to give it back to the educated Luddite—was that an oxymoron?—he tossed it into a desk drawer in disgust. He had better things to look forward to that evening.

Alex rode his strong black gelding uphill, stretching himself and enjoying the zest of at last getting away from the office, far away, with Susan and the young ranch hand Cassie Worth. Clement Valley was about as deep in the wilderness as he could go and still remain on his vast acreage.

After the irksome arguments and corporate busyness of the afternoon, this was heaven. He had spurned the convenience of using a company jeep; taking the horses felt more natural, more *real*. As the dense alders and ponderosa pines closed around the narrowing four-wheel-drive road, they rapidly left the log-cabin lab buildings and the Pleistocene Hospital behind.

Cassie, the spunky and at times incredibly earnest young ranch hand, urged her horse into a trot ahead, anxious to get to the high overlook into the next valley. The young woman's long chestnut hair had been quickly woven into a thick practical braid that dangled beneath her white cowboy hat. Her face still retained a splash of youthful freckles, and her clear blue eyes held a fresh sense of wonder.

*With good reason*, he thought, *since she has seen miracles*.

But Alex and Susan did not hurry. Feeling anticipation build, they rode side by side, smelling the creaking saddles, the sweating horses, and the sweet sun-warmed pine sap. It had been a long time since they'd been so calm, though young Cassie's presence would dampen any amorous impulses in the sleeping bags out by the campfire. No matter; it was good just to be together.

While Susan watched approvingly, he had made a brave show of switching off his pager, but within half an hour the cloying weight of corporate responsibility forced him to turn it back on. When Susan wasn't looking, of course . . .

Horse Valley was more lush now than it had been for millennia. Using Helyx profits, Alex had started this ranch by channeling mountain streams into the headlands above, so that his experts could use the moisture to grow the sedges that normally flourished only in tundra. Reflections of aspen shimmered in mirror puddles of water as he headed up the slope, relishing the crisp air. Purple poets always talked about the "forest



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primeval" and Alex couldn't get the phrase out of his mind. *That's how this is supposed to be.*

In low-lying swampy areas beside the path, giant ferns like horned and scaly monkeys' tails curled up, flourishing next to fluted flat-leaved hyacinth—ancient plants that had not grown naturally since the last Ice Age. As they rode past, he sniffed the mulchy smell, wondering if the resurrected plants were edible, if there might be a high-end niche market for, say, Jurassic salads. . . .

"Majestica is looking ready to deliver," Cassie called over her shoulder, slowing her mare so her two bosses could catch up. "I've gotten close enough three times in the last week to take readings, but Bullwinkle doesn't like it."

Alex smiled. "They trust you, Cassie." Forget the scientists and the so-called professional handlers; this young woman had a better knack with the big beasts than anyone else on the ranch.

Susan drew a deep, satisfied breath. "It'll be our first pureblood, after fifteen years."

"Think of it as an anniversary present," he said. "Without your grandiose dreams, I would have spent all my research money on a cure for flatulence." The three horses splashed across a stream, climbing steadily now.

Susan laughed. "I still think you deserve the Nobel Prize."

"Relieving the world's diarrhea problems through genetic engineering makes one fabulously rich, but earns no professional respect whatsoever."

Behind them, the view was stunning, a full mile of untouched wilderness. It felt odd to know that he owned very nearly everything within view, even from the highest vantage. Only in Montana was there enough land to tackle the really big projects that made his wife happy.

"After this, Alex, nobody will even bother remembering all the little things you did in your reckless youth."

Impatient with the two romantics and smiling with anticipation, Cassie led them toward the top of the ridge. All around the valley, thick pine and aspen forests covered the hills. Cassie slowed her horse as they entered a rank of thoroughly stripped trees that showed long scraped gouges in the bark.

Susan was amazed, and concerned. "They're foraging all the way up here? They shouldn't be wandering so far afield." She urged her gray mare into the great field of sedges and sages so carefully arranged by innumerable days of gardening.

Cassie cocked her hat back with a wry smile. "Do you want to be the one to tell them where they can and can't go, ma'am?"

Alex made a mental note to see about putting a few sonic "discouragers" up here. He couldn't imagine what would happen if a stray happened to wander down the valley to within view of the protesters at the gate. Then he'd have to deal with the local sheriff, the Feds, a dozen regulatory agencies, and a host of tabloids. . . .

As they emerged from the aspens, the girl's sweeping arm drew Alex's attention to the grassy lowland in the bowl of the valley. "See, they always come together at dusk. It's the best time to watch."

Their horses standing close together, the three of them looked down onto Clement Valley in the last light of afternoon. Susan could barely tear her dark eyes from the sight below, but she gave her husband a loving glance that said, *We did this, you and I.*

Alex stood transfixed by the slowly moving shapes before him. His company had been right to keep the media resolutely away from the valley, and here was the proof. You had to see the woolly mammoths for yourself.

Whenever he had a fresh glance at the herd, the beasts seemed like sailing ships. There was a stately glide to their passage as the great russet vessels crossed the flatness, each beast moving


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as though before steady winds. Only slowly did the mammoths tack and turn, ponderous yet inevitable.

As if Cassie had trained them to recognize her, the nearest behemoth raised its head and let out a long, soaring salute. The next took up the sound, and the next, and soon nearly three dozen massive beasts joined in the trumpeting call.

Alex felt an eerie shiver travel down the length of his spine. The strange, echoing song reached even deeper into his primal core, building in layer after layer, delving into bass notes seldom heard outside the cathedrals of Europe. Even when the haunting chorus faded into the soft sigh of a breeze among the shadowed pines, the three human interlopers remained still, afraid to move as if they had been the ones transported through time, not the mammoths.

"Humans haven't heard that call in ten thousand years," Susan said as she leaned over to kiss him. He was too overwhelmed to say anything at all.

With Cassie in the lead, sitting high on her roan mare, Alex and Susan rode down toward the mammoths in the last light of afternoon. The herd was accustomed to horses, and especially to the smell of the young ranch hand who tended them. Raised entirely without predators, the mammoths were unwary. Though his mare seemed a bit skittish, Alex did not feel threatened as he approached the magnificent woolly behemoths.

The sedge grasses were tall and resilient, grazed short and trampled flat especially around the muck of watering holes. Playing the Helyx CEO, Alex noted that at the grassy margins the cottonwood branches and even bitterbrush were being browsed down to nubs. He would have to speak to the tenders about keeping the food supply going so the animals didn't wander into the stands of trees bounding the meadows. Soon, the herd would outgrow this valley.

He made a mental note to look into buying even more land, maybe expanding the huge Helyx Ranch into adjacent valleys. The politics of doing that would be far worse than the economics; the perpetual gang of Evo demonstrators at the South Gate would grow, joined by garden-variety environmentalists. Folks around here didn't look much to the future—or to the distant past, either, it seemed—and they didn't like change. . . .

With the approach of the horses, the mammoths snorted and stirred. Bullwinkle, the big leader of the herd, hung his shaggy head and lowered long tusks as he gazed at the others. The mixed-bag of hairy elephants had a range of body types, each generation only a few years separated from the previous, and each one significantly woollier than either of the two hybrid mammophants Alex had allowed Geoffrey Kinsman to see.

Cassie halted her mare beside a tree completely stripped of leaves and half of its bark. "Best to tie up our horses here." She dismounted with the springy grace of a gymnast. "I prefer to walk among them."

"Aren't you afraid of getting stepped on?" Susan asked.

The ranch hand flipped her braid back between her shoulderblades and adjusted her hat. "No, ma'am. But I'm afraid for the horses."

The few stands of valley grass darkened to jade as the Sun settled on the distant blue mountains. A nighthawk flitted with thin cries above the willows of a narrow creek that meandered through the meadow. Alex's eyes followed the hawk up toward the peaks that towered against a hard cobalt sky already dotted with the fires of far suns. The light would fade fast, dark scarcely an hour away.

A perfect night to camp.

Cassie started ahead, glancing over her shoulder and resisting the impulse to leave the other two behind. Alex remembered when he had been that impatient, and that young—not so long



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ago. Though this entire project had sprung from his wife's dream decades ago, Cassie Worth was the unrelenting factotum who supercharged the Helyx staff and never seemed to sleep. She ran down innumerable practical details about exotic animal husbandry, and she figured out the answers for herself when no alleged "expert" had a clue.

Alex reflected as he watched the young woman move swiftly through the herd. To think that she had just applied to Helyx out of the blue. No advanced degrees, just solid experience at UC Davis, a farm upbringing, and an ache to bring back to the world something long gone. Alex had noted more common sense in Cassie than in half of his own VPs and Division Heads. And she had a real rapport with the animals.

"Come on you guys, I want to show them off, but I'll need to get us back up on the slope where I can set up camp for the night . . . or did you change your minds again?" She turned her clear blue eyes to Alex—did he see a girlish crush there? He was abashedly reminded that he had canceled their plans three previous times for the usual "business reasons."

"Nothing's more important tonight." Alex reached over to stroke Susan's shoulder. "My wife and I are going to sleep out under the stars."

"Where I can hear my mammoths snore," Susan added.

They moved among the gigantic but gentle animals; it seemed to Alex as if he had wandered into a truck stop filled with living, hairy semis. The heavy air was laden with smells like hot oiled leather, old upholstery, musk and fur—stronger than the closeness of bison or penned cattle. But it was a wild musk, from thick and wiry hair grown to protect the beasts from the cold of an Ice Age.

Alex felt giddy.

It was a pure joy to watch Cassie in her element, like a child at a petting zoo. She led them from one large bulk to the next. Alex had never before seen so many of the beasts together in the valley. In a single glance he could see that each successive generation had fewer of the humped backs of African elephants. Instead, the younger hybrids' backs sloped down, the rich cinnamon-colored pelts thickened, and the males' tusks grew.

*Closer and closer.*

Cassie reached beneath the coat of the nearest hybrid and pulled up the coarse guard hair to reveal silky red under-wool. "It's so good now we should be able to leave them out all through next winter."

"Even in Montana's worst?" Alex asked, trying not to sound as if he was just protecting his investment.

"They'll love it," Susan said, smiling at the young woman.

"And they're getting interested in mating with each other now!" Cassie said, then lowered her voice as if embarrassed. "I follow them on the vidcams, and they really go at it. Just frisky play, so far. After all, they haven't reached adolescence yet. But the males are starting to herd the females—another sure sign."

Susan said softly, "We can't actually let them mate, though."

Cassie cried, "Why not? Just think—no more egg transfers, no sperm-sucking games to play." Her face wrinkled in disgust, and Alex didn't want to imagine the details of the mammophant sperm-harvesting operations.

Susan put an arm around Cassie. "We're careful with their genes. Select for mammoth aspects, weed out the elephant ones. Unchecked mating would scramble all that."

Cassie looked stricken. Plainly this had been her big announcement.

"But you're right," Susan hastily added. "Just like in nature. Desire is the only sure diagnostic." She gave her husband a quick, sultry glance. His breath caught. "These animals know, right down in their hearts—which by the way are bigger than a human head, bigger



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even than Alex's!—that they are worth making more of."

He hugged her. "And so we'll make more." *Some people buy diamonds for their wives . . . I clone mammoths.*

Cassie made quick jabs at nearby shapes, showing off as she quickly recited the names of the other hybrids. "Those two are Rachel and Napoleon—the shorter ones are always the worst—and this is Angel Pie."

Alex was amazed she could identify the individual herd members so easily. The Helyx geneticists had used five to ten elephants for each step of the process, because it took twelve years for any one of the hybrids to mature to fertility. And some interbreeding attempts spontaneously aborted—Nature's editing.

Cassie led them unerringly to a huffing female, her big eyes casting a calm gaze down at the small humans. Long breaths steamed in the cooling air as dew condensed on the rocks and trampled grass. "Here, Majestica is at term and already showing signs of labor. Everything's normal, as far as I can tell. She's been in labor for about a week already."

"I can't imagine being in labor for a week," Susan said.

And the big female's gestation period had already taken nearly two years. "Mammoths and elephants aren't in much of a hurry about these things," Alex said.

Actually, the gestation period had varied with each hybrid generation, as the offspring approached pure mammoth stock. According to her continuing researches into the original genome, using numerous fourth-order projections with hypercomputers inside the pine-walled stable building, Susan was convinced that the mammoth gestation time in the Pleistocene would have been longer than a modern elephant's twenty-two months. One of the earlier female hybrids, Alexandria, had carried her baby for twenty-three months.

"We're converging toward the mammoth pattern in the ancient wild, I bet," Susan said.

Alex smiled wryly. Given her anxious attention to all aspects of the projects, his wife probably would have preferred to keep the pregnant Majestica in a separate corral back at the Pleistocene Hospital, with a whole bank of real-time blood-test gear, round-the-clock technicians, and a full array of instrumentation and diagnostics surrounding her pregnant bulk.

However, these creatures needed to bear their young naturally, in the wild, and Cassie Worth had seen more live births among ranch stock than any of Helyx's experts. She was ready.

But no one alive had ever seen the birth of a real woolly mammoth.

The smoke of green branches and dry wood wafted up from the campfire, crackling with a pungent, sweet bitterness. Alex breathed deeply, smelling the heady primal scent. Hidden in the gathering darkness, insects and night birds set up a simmering background music that seemed to come from a different time altogether.

Below them in the valley, under the light of the waxing moon and a billion stars in transparent Montana air, the herd of elephant-mammoth hybrids settled down for the night. Many of the big dark shapes still moved about restlessly. While some slept like mounds of dirt near the watering hole, others paced around, munching on sedge grass. Eerily, some of the mammoths on the fringe looked as if they were keeping watch.

Cassie busied herself, happy to be out camping, much more comfortable here within sight of her mammoths than up around the administration buildings. She never tried to understand the protesters, preferring to ignore them by staying far from the gate. "People always find something to complain about, especially when somebody else is successful," she had said once.



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The young woman had outdone herself with the fire, the bedrolls, the childishly simple dinner of hot dogs roasted on twigs over the flames, a speckled blue-enamel coffee pot hung over the coals. All they needed was marshmallows (and Alex wouldn't have been surprised if Cassie had them stashed in her saddlebags). A perfect evening, in every detail.

Helyx could have provided the most sophisticated camp equipment, thermal chargers for foodpacks, heated sleeping bags and damp-resistant tents. Alex could have assigned workers to set up comfort-weave tents, groom the clearing, erect tables, string lanterns, even prepare a gourmet meal.

But this was better, much better.

"When do we start singing Kum-bay-ya?" Alex said with a grin to his wife.

"I have a strummerpack," she answered, calling his bluff.

Alex's implanted pager tingled, and he recognized the source. He reached up, touching a contact point. "What's the trouble, Ralph?"

Susan frowned at him, mouthed the words, *I thought you turned that off?*

"Can't figure, Boss." His usually casual voice now sounded pinched with concern. "We're getting pinged by microwaves. Somebody's interrogating a passive receiver. Must be located somewhere around the ranch buildings."

"Not one of ours?"

"No chance. Just a simple incoming pulse from some airplane, flying pretty high. Don't think anybody could get much from that, maybe just a location marker. The pulse could be hitting some tiny receiver that shoots it back with a li'l information attached, I'd guess. Not powerful enough for us to track down where it is, though."

"Probably some new gear brought in by the demonstrators at the gate," Alex suggested. He didn't need a new technical puzzle to ruin his jealously planned evening.

"Could be, Boss. Those Evo types have plenty to spend on new toys."

"Keep on it." He disengaged the pagerlink, saw both Cassie and Susan staring at him with concern. He made a placating gesture but didn't volunteer any details. The ranch hand would assume it was yet another corporate emergency such as had canceled their first three outings; Susan, though, could read his expression much better. Her molasses-brown eyes trapped him again, looking like bottomless wells in the smoky campfire shadows.

He leaned against Susan as they both stared into the throbbing orange and yellow embers. Their clothes smelled of sweat mixed with the musk of mammoths. Alex preferred this sharp but resonant aroma to the infrequent, expensive perfumes his wife felt obligated to wear at ecological fundraisers—like the recent one she'd skipped in Miami.

Under the stars, Alex helped with the bedding down chores, glad for the chance to get his hands dirty rather than just pound on a computer keyboard all day. It felt good, and safe, to be out here, "just like a real person."

The crackling wood made him think of the prehistoric hunters, Cro-Magnon warriors who had tracked herds like this using spears and pits and cliffs to kill the giant animals for food, fur, and ivory.

Like the restored bison on the Great Plains, Susan's dream-experiment might turn out to be so wildly successful that large numbers of these once-extinct creatures could roam the open Montana range. They might wander north into Saskatchewan and Alberta, heading up toward the subarctic regions for which their huge bodies were designed.

He had been so focused on working one generation after another, converging toward a full-blood woolly mammoth, that he had not let his mind wander far into future possibilities.

"Maybe one day we'll have a large herd of mammoths that breed true and reproduce in the wild." He ran fingers over Susan's hair, recalling Kinsman's



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concern (one of his few legitimate ones) about the impact a sizable group of such huge grazers would have on the landscape and environment. What if they had to thin the herd? "Can you imagine if we had enough of them that we could even sponsor a good old-fashioned mammoth hunt?"

Cassie, very protective of the animals, glared across the fire at him. "What!? Use guns on my mammoths?" She had been working here only two years, but the mammoths were *hers*. "No hunting unless you play fair." The girl's firm lips curled into a devilish grin on her freckled face. "Dress your big-game hunters in furs, then send them out with stone axes and sapling spears. Pleistocene rules. I don't think you'd get many takers."

"Not me," Susan said. "Not for all the testosterone in the world."

Alex returned a noncommittal smile. He did not argue, but he knew both women were wrong. Over the years, he had encountered any number of too rich, too bored, dot-com millionaires or genetics patent holders—people who had delusions of immortality and an overblown sense of necessary machismo.

Even with Pleistocene rules, Alex knew he could find plenty of takers. . . .

As he bedded down next to Susan, the Moon continued to rise, spilling silver light. Even here, as isolated as one could be in the continental U.S., he felt as if he were under a spotlight. He couldn't sleep, and he knew Susan was awake and thinking beside him.

Below, the mammoths sounded restless. Snuffles and loud snorts rippled through the big animals. Most of them seemed awake. On the other side of the fire, young Cassie sat alone, her knees drawn up to her chin as she stared down into the valley, reflecting the animals' uneasiness.

Alex couldn't imagine what possible threats or predators could worry the gigantic prehistoric beasts this deep within ranch property. "Are they like this every night?"

Impishly, Cassie raised her eyebrows. "I *do* have quarters of my own back in the complex, Dr. Pierce. Sleeping outdoors is a treat for me, too."

A bright meteor streaked overhead, low and horizontal, like a rocket on the Fourth of July. It came over the line of trees on the ridge, flying hot, traveling with a speed and deadly accuracy that surpassed any shooting star.

Make a wish . . .

Susan was already on her feet, leaping out of the blankets on the damp ground. "It's heading toward the lab complex!"

The trail of fire faded into orange against midnight blue, and the incandescent arrow struck the valley behind them with a bright flash. The main Helyx compound. A muffled *whump*.

As Alex lurched to his feet, the implanted pager tingled again. "Boss, we've been hit down here. Somebody sent in a mini-cruise, I'd say. Hit the pines close to the hospital . . . still trying to assess the damage."

"A mini-what?" Alex subvocalized, and his words went back to Ralph.

"Backpack-sized cruise missile, Boss. Short-range, with a nose full of high explosive. A man can carry one a fair way, then launch it from a rack."

Susan was already racing for her horse while Alex paused to get an update. "I'm going there!" she shouted and swung herself up bareback. "Short Stuff and Middle Man are still in the corral."

"Wait! You can't do anything—"

"Just work things out with Ralph," she called over her shoulder, then raced her horse down the four-wheel-drive road and disappeared into the shadowed trees. He had never seen her ride like that before.

Reacting on instinct, Cassie was at their supply packs. She withdrew the two shotguns she had carried with them, ostensibly for protection against coyotes or bears.



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Alex didn't need to think hard about who might have done such a thing. "Kinsman was a decoy," he said to Ralph. "Him and his supposedly reasonable discussion, he was just a plant to get inside. But how could they target the hospital in the dark and from so far away?"

"I'm willing to bet they targeted this place with those microwave echoes I keep hearing. If Kinsman planted some sort of passive echo locator—"

"His pen! Damn, I didn't even think! He left it on purpose. They could have targeted from that. I'm packing up with Cassie, and we'll be right down there."

Before Alex could switch off, the security chief said, "Wait—that's gunfire. Jesus, those bastards are coming in from the South Gate!" Ralph's voice strayed for a moment as he barked orders to a security crew, who scrambled in response. "The hospital's in flames, Boss. We're sending people in to try and rescue the animals."

"Keep yourself safe," Alex barked. "Susan's already on her way." He thought of the two adult mammophants in the corral, the wonderful dodos and moas, all the exotic and frightening animals he kept in the solid-wall pens in the back of the hospital. And all of his people. He prayed his wife would be safer down there with Ralph and his crew than up here. "We're coming in—"

Another thin patter of popgun shots rang out. Alex thought he was getting Ralph's background noise until Cassie cried, "Just below us!"

"Ralph, we've got intruders up here, too."

"Clement Valley! Jesus, do you want me to send a—"

"You just do your job there. And watch Susan's back, dammit."

He shut down his link and studied the shadowy trees. Another few shots, yes, nearby. One of the mammoths bellowed in surprise, or perhaps pain, sounding like a squeaky cannon.

"Hey!" Cassie tossed Alex one of the shotguns, and he caught it instinctively. The weapon felt hard and cold and strange in his hand. She looked at him with an anguished face. "Maybe that missile hitting the hospital was just to get our forces away—so they could come up here and kill my mammoths." She swung herself up onto her already frightened mare and bent low, snatching the tether rope. "I'm going down to the herd."

The gunshots came faster as she rode hard down into the valley.

"Wait!" Alex called after her—pointlessly—then got his butt in gear.

He mounted his own gelding and followed her into the darkness. Here he was, the head of a gigantic international corporation—and his wife and a young girl had both jumped into action while he stood around and talked to himself.

The horses were already uneasy with the smell of the mammoths, and the pattering gunfire spooked his mount even more. He caught up to the young ranch hand as she tried to see down into the darkness. "You leave the mammoths alone!"

"Quiet!" he urged, fearing the shadowy attackers might target Cassie instead of the animals.

Sharp, flat shots from their left.

Alex saw dim shapes stalking closer, as if intimidated by coming so close to the prehistoric beasts. Simple rifles would have little effect on a woolly mammoth, he thought—just before another round of muffled percussive bangs.

A few seconds, then distant explosions came from the open valley floor.

"Grenade launchers."

"You bastards!" Cassie screamed.

"Hush! They don't know we're up here." He and the young ranch hand were still a hundred meters from the open grassland. They urged their horses closer. It was quiet for a moment, a deathly stillness.

The mammoths churned about, grunting, drawing closer like covered



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wagons circling against a Comanche attack. Amazingly, acting on instinct, the bigger bulls formed outer ranks, clearly to protect the rest of the herd. The alpha male, Bullwinkle, with its huge tusks and russet fur, snorted and moved forward like a locomotive, looking for an enemy.

No sign of the shadowy figures, but the fringe forests offered plenty of cover.

Alex knew that Cassie's first thought was for Majestica, the pregnant female about to give birth to the first pure mammoth. They rode toward her, and Alex prayed the beasts could tell the difference between friendly humans and deadly ones.

Abruptly, scarlet fireballs burst a hundred meters away . . . and another right on top of them. One of the wild grenades struck Majestica between the shoulders, and the impact knocked even the giant female battleship flat to the ground, her upper body cratered with ragged flashburn wounds.

Cassie screamed. She threw herself off her horse and raced to the fallen pregnant female.

Alex waved his shotgun around, then took a few high potshots, hoping the retaliatory gunfire would at least stall the attackers, send them scrambling for cover. But it was a pitiful gesture at this range. None of the terrorists came out of the tree line.

Gunshots rang out and ineffectual bullets peppered the mammoth-elephant hybrids, sending them trumpeting into a frenzy. Some charged, stopped, trumpeted. But the big male Bullwinkle thundered into the night, toward the attackers hiding in the trees.

Alex dismounted and came up beside a determined but weeping Cassie. His heart wrenched, knowing they had all been betrayed. The young woman impatiently wiped tears from her eyes and got to work. "Damn, Dr. Pierce—I don't have the equipment for this!"

Back in the forest, startled shouts turned to shrieks. Alex could well imagine the giant bull trampling the bastards into paste on the ground. Bullwinkle hooted, a powerful bellow that brought more shrill screams. A grenade burst near the beast, then the big mammoth was into the trees, smashing branches, splintering trunks, following the panicked outcries.

More screams. He did not think further about what Bullwinkle was doing. He could see only the pregnant mammoth's blood shining dark and wet in the moonlight. "Don't worry. I'll help," he said to Cassie. Corporate CEO bullshit, but it seemed to be what she needed to hear. He knelt beside her, trying to anticipate what the young woman was trying to do. She worked with utter concentration, adrenaline, and desperation, staving off panic.

As he tore off his shirt and wadded it up into a large pad—nowhere near enough, he saw, as he pressed it into the gaping wound—he heard a faint sound and looked around. Other mammoth hybrids bellowed, but the gunfire had halted for the moment. Bullwinkle's work?

The whispery sound of feet in the sedge grasses came nearer. Cassie didn't notice it. Bare-chested, Alex backed away from the dying animal, leaving his shirt to soak up a gusher of blood. He smelled gunpowder and meat. "They're coming back," he said. Grabbing his shotgun from the trampled ground, he moved as quietly as he could around Majestica's massive bulk.

"Keep them the hell away from my mammoths," Cassie said, her voice thin. She didn't even look up from Majestica.

Alex jacked a shell into the shotgun, hoping the flat clack-click sound would be enough of a deterrent. *Never.* Halfway around the heaving beast, he crouched down, looking across the moonlit expanse.

He cursed himself as much as the fanatics. He had underestimated their dedication, dismissing them entirely. He had scoffed at their mindset, never giving them credit for a zeal that would push



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them beyond theoretical protests. How could they be so *vehement?* There was a long, precarious bridge between waving signs and launching missiles, but Kinsman and his Evos had crossed it.

He'd considered the Luddites to be quaint, backward, even silly. Now they had proved deadly. Causes had always attracted violent crusaders whose actions seemed inexplicably extreme to most people—prolifers shooting abortion doctors, environmentalists "protecting the Arizona desert" by setting fire to luxury homes. Could any ends justify such means?

The Evo crusaders came out of the trees, hunched over as they emerged from the protective shadows. They were competent enough, moving quickly, not talking. But Alex saw the reflection of their eyes as they covered the last twenty meters. Three that he could see, two headed directly this way, weapons ready . . . thinking they had already won.

He raised the shotgun and a lot of thoughts ran through his mind. It was easy enough to think you could shoot at an enemy, someone with a grease-blackened face and cradling a grenade launcher, pistol strapped at his waist. But when it was a kid of maybe twenty . . .

The kid raised an arm to his comrades, who immediately squatted and aimed—at Majestica. And Cassie! They knew their target. They knew exactly what they intended to shoot.

And Alex had no time left for doubt. Executives, he often said to others, were people who could make decisions on time. Well, here was one. He shot the kid with a spray of pellets. He hit him in the legs, but square on.

Alex did not let himself hear the screaming as he jacked the next shell in, sighted on a man who had half-risen to his feet and was swinging a long-barreled weapon toward Alex. "Cassie, get down!" he yelled, then sighted and squeezed off the round. The feel of the gun was as natural as when he'd potted away at clay pigeons on weekends, long ago.

Now the third Evo—a woman—was already running away. He let the terrorist take three more strides to be sure she was out of lethal range. The blast of pellets against her shoulders and backpack did not knock her down, but she cried out and ran even faster in a headlong stagger back toward the trees.

The first kid was yelling, rolling around with his bloody-hamburger legs drawn up to his chest. The second man lay still; Alex didn't even know where he'd hit the terrorist. The woman made it to the trees, where Bullwinkle was still crashing around. Alex kept down—the Evos had plenty of distance weapons, and would be looking toward the source of his shots.

"Dr. Pierce! I need your help here!" Cassie sounded closer to panic than he had ever heard her.

Slinging the shotgun low, ready to spin around and open fire again into the night, Alex scrambled back around the dying Majestica.

Susan rode hard, and her horse was hot, its mouth foaming as she careened down the bumpy jeep road. She could see the darkness of trees and night blended with probing beams of hard white surveillance lights ahead.

She and Alex had always talked about beefing up security in an apron covering the entire approach from the South Gate. When the protesters had settled in, they'd brought their own lights, as well as coolers of food and drink, so they could squat down and begin chants and drum beating in a general disruptive "people power" party. They kept it up until the early hours, youthful idealism uniting with the universal instinct to party. Annoying, certainly, and frustrating—but nothing to be taken seriously.

That had been their biggest mistake.

Occasionally, those little protests had only been a distraction, a cover for one or two Evos to slip past the fencing and guard stations in the dark. Once inside,



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though, they had no good idea which targets to go for, what vandalism to accomplish. Inept commandos, they generally blundered into staff housing or maintenance sheds, which had been deliberately disguised to look like laboratories and stables.

But now, the log-fronted Pleistocene Hospital was on fire. They had struck directly to the heart of the retrograde evolution project.

"Damn you," she said. "Damn you all." She kicked her horse, riding harder.

The tall pines surrounding the corral had become torches in the night, crackling resinous flames. From inside the high reinforced fences she heard a roar, an indescribable screaming cry that sounded like nothing human. Short Stuff and Middle Man, the first two mammophant hybrids, were still in there, far from the safety of the rest of their herd . . . brought back to the ranch buildings for regular health monitoring.

Susan dismounted from her gray mare before the horse had even come to a stop. She hit the ground running and, frightened by the noise and the smoke, the exhausted mare trotted away in confusion. The fire from the Ponderosa pines had already descended to the corral fence. Cassie slammed through the gate, calling out to the two oldest mammophants.

Middle Man had backed to the far corner, away from the burning trees, away from the light. The big male trumpeted a sound like anguish, obviously frightened and confused. He bled from several wounds in his thick hide, but the injuries seemed relatively minor. Susan didn't even stop to consider whether Middle Man might charge her.

In the center of the trampled enclosure lay Short Stuff, collapsed to the ground like a defeated calf in a rodeo spectacle. High-powered gunshots had blasted both of her forelegs, ripping gouges in muscle and bone until the female hybrid had crashed. Short Stuff chuffed and hooted as she struggled on the grass, her legs bloody and useless appendages.

In shock, revulsion, and helplessness, Susan swayed backward, grabbed for the corral fence to support herself, but missed. Watery-kneed, she sank down, and froze, utterly unable to do anything. Short Stuff trumpeted again in unspeakable pain.

Ralph Duncan strode into the corral, swinging his head from side to side, taking in details. His eyes had always looked world-wise, as if they'd already seen everything, but now his face had a disgusted horror. "God damn! God *damn!*"

He strode forward like an avenger, holding the powerful rifle at his side. Susan made a strangled sound, and he whirled, ready to shoot, but when he recognized her, his expression instantly changed. "Miz Pierce!"

Short Stuff let out another hollow, trumpeting call. Ralph's expression hardened, and he turned away from Susan, ignoring her. Without hesitation, he marched up to the writhing, wounded mammophant, pushed the barrel of his rifle up against the base of Short Stuff's massive skull, and pulled the trigger. The hybrid groaned and slumped. Ralph shot her again, then turned back to Susan. His face was ruddy and murderous. "God damn it!"

Shaking, Susan pushed back to her feet, then grabbed the corral fence and vomited. More shouts and gunshots came from the main lab complex. Through the fence and the trees she could see flames shooting from the admin building. She coughed and spat. "How many are there? What—"

He took her arm and led her out the gate. "Middle Man's fine for now. I've got security troops split between defending the ranch and trying to fight the fires." He touched his earpiece, listened, then shouted, "Dammit, don't wait for the sheriff! Just move on it!"

Susan heard the distant patter of gunfire, military-style commands, and the



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frenzied shouts of shadowy attackers. They could have broken through the fences anywhere. Were these the same protesters that had innocuously waved their signs and posed for the TV cameras? Could it all have been a feint, a ploy to let Helyx security believe the Evos were ineffectual whiners and bored activists in search of a cause . . . when all the while they were planning this brutal strike as soon as they could get a man inside?

She saw birds fluttering in the trees, the passenger pigeons disturbed from their nests in the big oaks. "I'm going to the hospital!" She heard sounds that could only be giant moas squawking in panic. "Ralph, get those fires put out!"

As she ran toward the Hospital, Ralph yelled louder into his voice pickup. On one side of the main admin building, a few men had set up a hose and were spraying the yellow flames on the log walls, but fiery fingers already crept along the roof.

Susan didn't give a damn about the computers and office furniture inside. She ran toward the hospital itself where all the retrograde hybrids were kept, her life's work, the maturing ambassadors of species long extinct. Why would anybody want to harm them?

*Probably the same people who break into cancer-research centers and "liberate" all the experimental animals*, she thought. *I guess they don't see the contradiction.*

Out in the hospital yard, she saw tall, ostrichlike moas set free from their cages, wandering around in terrified confusion. Brown feathers ruffled, serpentine necks swiveling about, horny beaks open with hissing squawks, they kicked up dirt with lizardlike feet and pecked at any person who came close. Ungainly dodos scrambled about like overgrown drunken chickens, honking in fright. Susan heard other animals scream and yowl from within the hospital itself. Smoke oozed through several broken windows, growing thicker, blacker.

Just then a man with a prim face and dapper-looking clothes stepped across the porch holding a pistol in his hand. Geoffrey Kinsman. Like a grim executioner, he pointed at the dodos and methodically shot them all, moving from one to the next to the next.

Though armed with nothing but her anger, Susan raced toward him. Other protesters ran past Kinsman into the lab building, not willing to simply let the fire do its work.

Kinsman turned toward the closest frightened moa, putting three bullets through its long neck. The giant bird toppled like a fallen tree. Not even pausing to reflect on his handiwork, the man stalked toward the smashed-open door of the hospital and vanished inside.

Susan screamed in outrage, but Kinsman didn't even notice her.

After stepping over the shattered carcasses of the magnificent lost birds, she barged into the main laboratory. Evos were overturning desks, smashing computers, dumping animal feed on the floor in a wild frenzy, like capering cannibals celebrating the arrival of a boatload of missionaries. These crusaders had no organization, no plan, just chaos.

Dressed in her jeans and camping clothes, Susan entered the lab, smelling the fire and spilled chemicals, the blood and nose-tingling gunsmoke.

In the harsh, stinging smoke she saw Geoffrey Kinsman, proud slayer of helpless dodos and moas, trotting from cage to cage, shooting every creature inside. Fast, methodical, intent.

Susan's eyes burned with disgust. Ducking through the smoky light, she went to the cages on the other side, past lab furniture, desks, equipment racks. She threw open cage doors and coops, chasing the dodos, moas, and other hybrids out, giving them a chance. Squawking and hissing, the marvelous creatures ran, fleeing the fire, fleeing the gunshots.

There, dammit! The chaos grew.



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Shouting and gunshots echoed from outside. She heard a shrill whistle, a bullhorn. A helicopter circling.

Grinning, a blond-haired, clean-shaven man ran past her holding a long shovel, battering file cabinets, smashing beakers, computer screens, even ceramic coffee cups. He took a swipe at a waddling dodo, missed, and Susan grabbed the shovel handle, wrenching it out of his grip.

The man shrugged, then toppled a heavy laser-ROM storage rack, scattering the prismatic platters like Christmas ornaments. He snatched up a crowbar some other protester had dropped.

From nearby came the sound of a window smashing. More strangers ran in through the hospital door, carrying weapons.

When his pistol was empty, Kinsman took an assault rifle from one of the Evos, checked that it was loaded. Then he looked up and saw Susan. Recognized her.

"Damn you!" she said, raising the shovel as if it was a match for his rifle.

Behind her, the reckless blond Evo grabbed the closed doors of the larger pens at the back of the laboratory. The barricaded, reinforced rooms.

Kinsman hesitated with his rifle, smug with self-justification. "This has to be done."

With a deft twist the blond Evo pried open the lock. He must have expected nothing more than another awkward-looking bird. He held his crowbar loosely in one hand, as if ready to bash a few more animals.

And a saber-tooth cat lunged out at him, already maddened by the fire and the noise.

The big panther's front fangs gleamed, as long as scimitars. It reared up to embrace the man and with a throaty growl it bore him down, muscles moving like liquid beneath its mottled, long-furred coat. The Evo screamed as the panther/saber-tooth hybrid tore open his chest, raising long curved fangs and plunging once, twice, three times.

Susan managed to shout "No!"—just as a panicked Kinsman opened fire.

On the sedge grass, trampled and bloodstained, Cassie leaned over the gasping, quivering hulk of the fallen Majestica. The female almost-mammoth panted and shuddered, her body core ripped open by the grenades.

"She's dying." Cassie looked up at Alex, her eyes wide and pleading, as if somehow this important corporate executive could do something.

"Yeah," he said uselessly.

She seemed to be in a daze, saw the shotgun slung low in his hand. "You shot at the Evos?"

"Forget them."

Majestica's body heaved and clenched and trembled in spasmodic labor—dying, but also following a biological imperative. Alex heard a snorting and pounding sound and held up his shotgun, ready to defend them against a continued Evo attack—but he saw only the huge head and long curved tusks of the angry Bullwinkle. The large mammoth stomped on the ground, thrashed his shortened trunk.

In the stark, silvery moonlight Alex saw a few flecks of black blood peppering the shaggy fur, minor wounds from gunshots. He had expected to see the bull's long ivory spears coated with gore, his front feet splattered with the blood of crushed humans. But Alex heard the Evos still screaming and crashing away into the night as they fled up the valley.

The bull mammoth had let them live. Bullwinkle could easily have trampled every one into the ground. Instead, he had just driven them off and turned back to come here. At the moment, Alex himself didn't feel so civilized.

Lumbering close to Majestica, the shaggy bull sniffed, quested with his hairy trunk. Bullwinkle watched with round, wise eyes as Cassie felt the pregnant female's heaving belly, her hands



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exploring the quivering muscle and tough hide.

She drew her long hunting knife.

The other hybrids milled about nearby, circling and snorting, some trumpeting their pain, all clearly agitated. One of the youngest hybrids waded out to the middle of the muddy watering hole and raised its trunk high as it honked into the night.

The Evos had gone away, their destruction accomplished, leaving pain in their wake. *Making their savage point.* Alex knew he should call Ralph and his security men, bring them out here in Helyx choppers to run the terrorists into the ground, apprehend them and haul them off for federal prosecution.

But as he knelt beside a blood-streaked Cassie, he didn't feel that was important enough right now.

The pregnant female had closed her intelligent eyes in wrinkles of dark skin, blinking only occasionally. Majestica's breath was slow and deep, a bass-noted wheezing, accompanied by a bubbly wet sound of blood and air oozing from large holes in her massive torso.

Majestica's pelt gleamed, glossy and moist. A heavy musk mixed with the metallic sourness of blood rose from the laboring mountain. The female's pelvis was tilted, her womb clenching as she used the last of her energies to squeeze.

A charge of tension permeated the air, a slow silent sense of gathering energies . . . of time contracting down to a culmination.

Cassie pressed her hand against the distended belly. The abdominal muscles shuddered, but Majestica was clearly dying in the moonlight. Even Alex could see that. She wouldn't last long enough to give birth, and the purebred infant woolly mammoth would die inside the womb.

He knew that young Cassie had needed to sacrifice mother animals before, delivering their young by cesarean. It was a part of ranch life when there were a lot of animals to herd and tend. In her hesitation now, he read that Cassie didn't know if her muscles and her resolve and her knife edge would be up to the task she now faced.

Ralph's hoarse voice chirped in Alex's ear, with words so devastating that Alex could spare no attention for what the young ranch hand was about to do. "Boss, you'd better get back here." The old security chief paused, as if gathering courage. "It's Susan. Get back here now."

Cassie barely looked up as Alex ran to his horse.

Sobbing, she raised her long knife high, hesitated, then plunged it deep.

When Alex rode up to the main Helyx complex, two of the ranch buildings were engulfed in flame. Fire crackled and roared, clean woodsmoke mixed with the foul stench of burning electrical wires, chemicals, and plastics.

He called for Ralph, then he saw the security men dragging bodies out onto the lawn in front of the Pleistocene Hospital. His stomach lurched.

Alex had underestimated the Evos completely, the intensity of their gut-level resistance to what he was doing. And Kinsman himself, a former colleague, was someone who should have known better. Alex had rolled his eyes at the silly signs, foolishly dismissed the objections of people he considered Luddites. "It's not nice to fool with Mother Nature."

Recreating the mammoths had aroused such a passion, such a sense of wonder in his wife—but he had never considered that it might engender equal and opposite emotions in her detractors.

He called for Ralph again, but his voice broke as he stumbled across the yard. The rangy old man jogged up to him, feverish, his leathery face fallen in despair. He threw himself on Alex, both arms around his shoulders. Alex went weak with dread.

"Where is she?" he croaked, but he



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could tell from the stiffness in the security chief's muscles that he was already too late. "Where is she?!"

Ralph staggered back. Without a word he walked with Alex toward the burning Pleistocene Hospital. In the acrid yellow glow, a few surviving animals ran about in panic. Passenger pigeons squawked from the oak trees. Others fluttered across the night sky, escaped from burning nests. Bloody mounds of feathers on the grass marked the slaughtered dodos and moas. *Extinct again.*

He took a few steps, choked on acrid smoke, turned.

Susan lay outside on the ground where Ralph had carried her. She had a crumpled, broken look, he thought abstractedly. That was when the fog began to wrap itself around him, dulling the clamor, shrouding the world in a ghostlike slowness. He shook his head, but the fog remained. His field of view telescoped away and he staggered. He reached out to steady himself on a beam and his hand felt nothing. Sour air rasped into his lungs. The iron taste of blood told him he had bitten his tongue. And the soft fingers of fog thickened.

The feathers of ancient birds fluttered around her like a halo, catching the glow of hot white security spotlights. Her flannel shirt had soaked up the crimson blood. She lay, waxen, lifeless. He did not count the gunshot wounds.

In the background he barely heard Ralph's security men shouting. Ranch workers, in shock and keeping themselves moving with forced activity, braved the inferno of the lab to rescue a few remaining experimental animals from their cages. To salvage some of the records. To preserve cellular specimens. Sometime in the distant future, he would probably thank them.

None of that mattered now.

He tried to take two steps toward Susan, but his muscles disobeyed. His knees buckled, weak and watery. Alex collapsed, sitting on the rough ground. Close enough to see her, but she would never again be close enough to touch.

An empty man rode back out to Clement Valley. The cool night air brushed at his face, but he did not feel it. The east brimmed with a pale glow but he did not see it. The soft fog fingers were still there in his head. He shook it.

He found Cassie, her shirt and braided hair and jeans soaked with dark wetness. When he saw the blood, he had a sudden fear that she too had been shot. But she got up on unsteady legs, looking utterly exhausted in the beam of his flashlight.

Then Alex saw the small creature, like a newborn elephant but covered with matted wet fur. It stood already. About the size of a riding lawnmower. The baby mammoth moved on wobbly legs slick with its mother's fluids—aware and healthy. Somber eyes accepted him in a mute communion.

Alex drew a deep breath. A mammoth, the first purebred ambassador from that extinct species, arriving on this night of smoke and blood.

He felt a trickle of amazement through his shell of despair. Though its mother had been murdered by attackers, this fourth-generation offspring had been successfully delivered alive.

In spite of all this. Thanks to Cassie.

"It's a start," she said. Her large, wonder-filled eyes stared at Alex as he touched the thick reddish fur on the young mammoth's sturdy shoulders. He knew he should tell her about Susan, but he wasn't ready to deal with the questions . . . or the sympathy. He couldn't think of anything to say.

"I want to name him Adam," she continued. "Seems appropriate."

The rest of the herd huddled together in the naked night, while Bullwinkle stood near Majestica's carcass. He twitched his trunk, snorting steam plumes in the waning moonlight. Alex imagined the big bull was as anguished at losing his mate as he himself was over Susan. He heard a low, guttural note in



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its sighs and wheezes that had not been there before.

He turned away. Shared grief was little comfort.

The big animals clustered together, calmer now, as light seeped into the valley. Tall, powerful, magnificent. Back from extinction. Distantly, hollowly, a part of Alex thought that the throwback Evos were a portion of humanity that might be better off extinct. Not these creatures. Not these strong and wonderful miracles that his wife had brought forth from dreams.

Alex stood among the herd and looked at young Cassie, seeing her resolve undampened. She was saying something but he could not hear, somehow.

In Susan's memory, he promised himself that he would carry on this project. Even though he might have to move to the ends of the Earth, where he and the mammoths could be safe . . .

Somehow.

Adam tottered off toward the herd. It waddled in the grass, lit by thin rays of sun, bleached of all color. Bullwinkle saw the small moving thing and sent a blaring trumpet salute. The herd answered with a chorus of bellows and huffs.

In this moment Alex felt his own life slip into insignificance, one more mote beneath the hard stars. One more member of a newcomer species, a mere vessel. His best work lay forever in the past now, but he could still make some difference.

The fog around him cleared, just a bit, letting in the glow of the east. Susan could live only through these creatures, through her work. He would have to speak and care and fight for his wife's memory, too, and for all of her legacy, living and dead.

Clouds were moving in, he noticed absently. It was a shrouded dawn, though it could turn bright. ■

Anyone who has never made a mistake has never tried anything new.

—Albert Einstein

The trouble with the world is that the stupid are cocksure and the intelligent are full of doubt.

—Bertrand Russell



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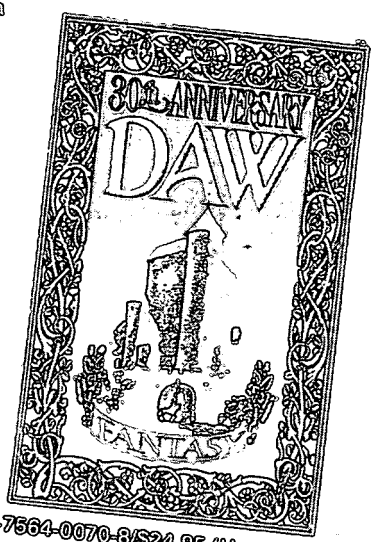


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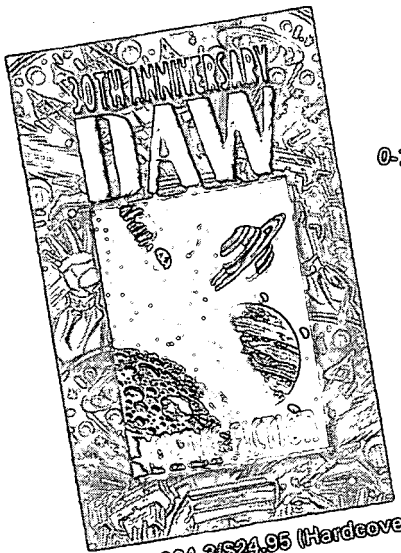


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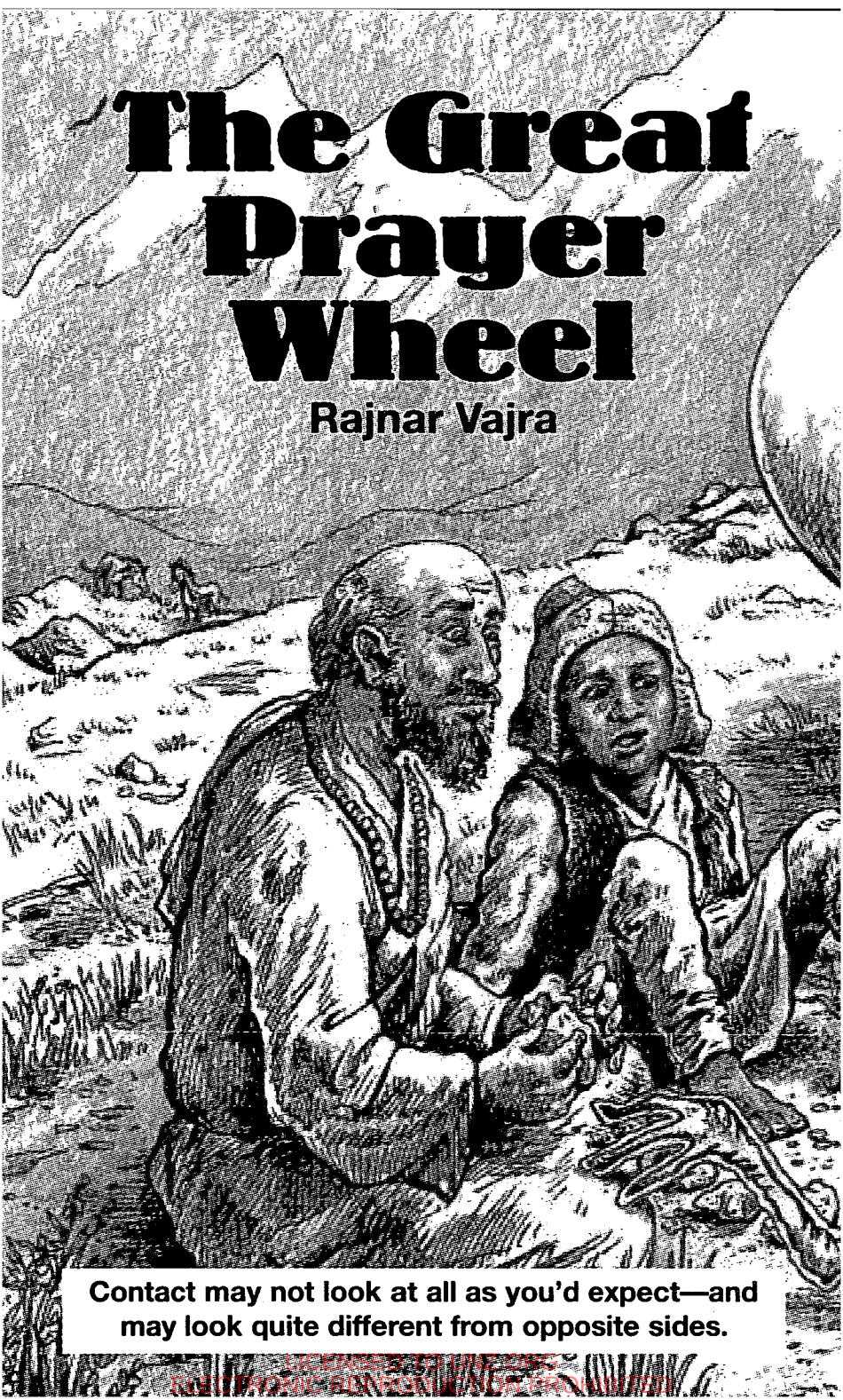
# The Great Prayer Wheel

Rajnar Vajra



Contact may not look at all as you'd expect—and may look quite different from opposite sides.

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Illustration by Sherlock

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Invocation: We bow to the four cardinal directions to show respect. To Sky above and Earth beneath we bow to show devotion. We bow to the outer world to acknowledge our limitations. To the inner realm, we do not bow. The inner realm surpasses respect, devotion, and all limitation.

Rumors that Vilakruna was coming to visit began almost a year before the great sage actually arrived.

In the tiny Tibetan village of Barwa in the shadow of that mighty mountain, Namcha Barwa, rumor was better than news. With rumor, it was easier to imagine miracles and wonders. Tsenshap, youngest yak-herder in the village, fancied that Vilakruna was levitating eastward in stately dignity all the way from his reputed home in Northern India. Sometimes instead, the boy fantasized that Tara, Goddess of Compassion, was carrying the sage with infinite gentleness in a soft green hand larger than any mountain.

Tsenshap's vivacious imagination only failed when it came to visualizing Vilakruna's face. No one in Barwa, not even ancient Sogyal Shaman, had met the holy man or met anyone whose claim that they'd met him rang unmistakably true. However, again according to rumor, Vilakruna was extraordinary in every way.

Ten arm-spans tall and dripping wisdom so thickly it dampened the ground at his feet, according to Jamjang who was the village expert on everything. Atisa the Foolhardy, who'd once climbed distant Chomo Langma on a dare, maintained that the great sage was virtually a living skeleton who'd gone beyond any need for physical sustenance. One passing traveler had stated with great sincerity that the wise man's eyes weren't mere flesh but brilliant emerald cabochons.

Tsenshap was fascinated by such claims and found them perfectly reasonable. After all, he himself bore a mystical peculiarity of the body. He'd been blessed with a birthmark on one shoulder that looked to everyone like a painting of Tara done in shades of brown. This gift had always strengthened his connection with the Goddess.

The yak-herder wouldn't have been surprised if the wise man proved to be ten arm-spans tall *and* a living skeleton. But Tsenshap was even more intrigued by Vilakruna's fabulous mystic powers. No one could say exactly what powers these were (although Jamjang never let ignorance bar his mouth), but everyone agreed the wise man had them in abundance.

The part that really made the boy's eyes glisten and his chest swell was *why* Vilakruna was coming. This could only be to investigate the Great Chariot. Nothing less would bring such a renowned holy man to such an ordinary little village. And who had found this chariot? Why, Tsenshap himself! In a sense, Vilakruna was coming because of him!

Fall passed and the winter was a bitter one. But then, Tibetan winters are naturally cruel. Trees do not thrive at such elevations and villagers survived the long nights as they always had, huddled around fires of dried yak dung, sipping salted butter tea and telling stories in voices loud enough to be heard over howling winds. Some were doing their huddling in small buildings made of stone and clay, but the poorer community members like Tsenshap and his family still lived like their ancestors in large, square tents made of black yak wool and insulated mainly by ice and snow. During winter, everyone had to be on their guard, for tigers had been known to prowl the village searching for food.

By spring, various tales illuminating Vilakruna's spiritual prowess had become gaudy with embellishment.

Then, one particularly fine summer morning, the great sage finally showed up. Despite so many florid expectations,



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no one was disappointed in Vilakruna, not even little Tsenshap. True, the holy man wasn't magically floating along in a dignified lotus position and there was no sign of divine green energy around him. In fact, he merely used his legs like everyone else. And although he was definitely foreign and tall indeed, the sage was no giant, nor a bag of holy bones. Yet Vilakruna's personality made such fantasies seem childish.

For one thing, the man had *weight*. Not physical weight, but a magnetic presence that pulled irresistibly at Tsenshap's attention. And Vilakruna's green eyes (probably not emeralds after all!) gazed steadily at each person with a calm, open acceptance more loving than mere friendliness. His lips were wide and straight and it was hard to pinpoint why they seemed to be smiling.

With so much force of character, one might think that everyone else would have faded to insignificance. But it was not so. If anything, the villagers were enhanced; their eyes glowed as if a golden sun was shining in them. Tsenshap was startled at an unexpected beauty he suddenly found in such familiar faces. Only Sogyal, the village shaman, seemed immune to the visitor's radiant charm. And even Sogyal seemed more . . . present.

There was one oddity about the traveler aside from his palpable kindness, gemlike eyes, lack of weapons, and generally exotic appearance: he was unaccountably clean. His faded blue robes were as unsoiled as if they'd been freshly washed. And instead of smelling like a man—sweat and yak butter—Vilakruna smelled rather like the sandalwood incense Sogyal burned to honor important Bon religious occasions.

Naturally, it was up to the shaman to greet the sage, introduce him to important community members (including himself, Atisa, Jamjang, and Drondonpa the Builder), and make traditional offerings of tea and freshly baked, specially spiced *tsampa* (roasted barley flour cakes).

Sogyal wasn't naturally affable and tended to view other holy men with a sour eye. He felt the old ways slipping away and resented any threat to his spiritual authority. But what made this an unusually embarrassing moment wasn't his typical iciness toward religious savants, but that Vilakruna had inconsiderately arrived before the cakes were ready.

No one was to blame. A runner from Dhantyen, the next village to the south, had given a scant hour's notice that the great man had been spotted in the area. Children had been hastily dispatched to various grazing fields to recall nearby yak-herders while everyone still in the village scrambled around, trying to make Barwa look inviting and clean, or at least neat. Sogyal's wife baked with ferocious concentration and while the shaman was still greeting Vilakruna with unwonted lengthiness, she surreptitiously placed the results of her labors in her husband's hands.

Sogyal breathed a sigh of relief and cut short what was, to him, an overly effusive welcome. Of course, he pretended he'd had the tsampa all along.

The holy man, who'd waited patiently through the improvised speech (albeit with a growing twinkle in his eyes), graciously accepted the food, thanked the shaman sincerely, and then *thanked Sogyal's wife*, which was unheard of. He took a sip of tea and a few bites and pronounced the offering delicious. Vilakruna spoke excellent Tibetan, but with a slight accent as if he'd learned the language in the Amdo region to the far north.

Then the great man's awareness swept downwards and fastened onto Tsenshap's round face.

"Might you be the person who found the chariot?" Vilakruna asked gently. "I'd heard the finder was a young man."

The boy was tongue-tied, not from fear, but because this sage's presence was overwhelming at close range. Tsenshap stared into those green, intensely


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awake eyes and tried to remember what question he'd just been asked.

Silence covered the village like a yak-wool blanket.

"Was it you who found the chariot?" Vilakruna repeated patiently for the fourth time.

Tsenshap's mind was locked so firmly on the savant himself that he simply couldn't grasp the man's words. Sogyal cleared his throat as if he wanted to answer in the boy's place, but didn't dare interfere. Jamjang opened his mouth to speak, but Sogyal's glare put an end to that.

The sage was aware of this by-play and amused in an affectionate way, but he kept watching Tsenshap who was clearly involved in some internal struggle.

In fact, the youngster was furious with himself. Perhaps he was not fully a man yet, but did he not have a man's responsibilities? There was no excuse for acting like a speechless infant! This wise man had traveled from the ends of the Earth, or not far from the ends, and was asking him a simple question. He deserved an answer!

"For the love of Tara and Manjusri!" Sogyal whispered harshly as if Vilakruna's ears were too refined to gather whispers. "He wants to know if you found the chariot!"

Tsenshap suddenly retrieved his balance, thus making a long stride down the road to maturity.

"Yes, Master. I found it. My name is Tsenshap."

Vilakruna's expression didn't visibly alter but somehow it seemed to radiate approval. "Is it far away, Tsenshap?"

"Not far, Master. A quarter day's travel. It lies at the end of the Eastern High Meadow."

"Ah! Will you take me there to see it?"

*"Me?"*

"Who better?"

"I would—I would be . . . infinitely honored, Master. But my animals—"

Sogyal snorted loudly. "I will have someone tend them in your place, child. You are free to guide our, um, treasured guest wherever he wishes. And take the remaining tsampa along lest your stomachs grow empty before your return." The elderly man's tone was less kindly than his words.

"Thank you, Shaman," the sage and the boy said in perfect unison as if they'd rehearsed. Tsenshap tenderly placed the cakes in his food sack and slung the leather bag over his "goddess" shoulder, the one with the birthmark, to infuse the tsampa with an extra blessing.

The shaman's lips twitched into an unwilling smile at the boy's utterly serious expression, but Vilakruna perceived anger and grief hiding behind the rheumy eyes.

Sogyal stared back at him challengingly. "Sri Vilakruna," he said, "the chariot was a munificent gift and a clear warning from the gods to the village of Barwa. Our gods are unmistakably commanding us to remain true to the religion of our forefathers. Do you hear me?"

Vilakruna felt deep compassion for the man. The days when Shamanism (and its more recent, codified form known as Bon) reigned unchallenged in Tibet were obviously ending. The first wave of Buddhism had already washed over the mountains. . . .

"I thank you for this opportunity, Sogyal Shaman. For the sake of my own clarity of perception, I will attempt to approach your chariot without preconceptions. But surely, I will find no contradiction to inspired beliefs."

Sogyal bowed his bald head grudgingly.

"When would you like to leave, Master?" Tsenshap asked eagerly.

"Whenever you feel ready."

Tsenshap retrieved his long shepherd's staff from its resting-place against a nearby wall. This staff, like all wood in the village, had been brought up from the remote lowlands. "I am ready now,


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Holy One," he said, turning toward the East.

Vilakruna walked alongside his guide, adjusting his pace to the boy's smaller stride and admiring the village in passing. To his eyes, it was a pretty sight. The dark tents and stone houses had an instinctive grace, set like jewels in a bezel of snowy mountains. The simple architecture seemed to subtly reflect the shapes of those mountains. The cloudless sky was so blue it could have been made of crushed sapphires.

Colorful prayer flags—cloth cylinders painted with shamanistic symbols or Bon religious sayings—were hanging from various surfaces, twirling in the wind. There were also dozens of wooden prayer wheels on clay stands waiting for anyone overcome by a sudden sacred impulse to pick them up and give them a good spin. Everyone knows that a rotating written mantra declares itself with each revolution.

The prayer wheels, too, mostly had Bon slogans although Vilakruna noticed that the phrase "Om Mani Padmi Hum," the Jewel in the Heart of the Lotus, had been inscribed on at least two.

That was a Buddhist saying! Vilakruna was surprised to see it here and equally surprised to note one prayer wheel with a plain Jain admonition against violence. Perhaps the shaman was wiser than he'd seemed, allowing enough religious diversity to avoid the appearance of being a spiritual tyrant. Some of the mystical sayings were written in the antique bone-oracle script, others in Han ideographs, and still others in the Indian letterforms that were gradually becoming the standard writing in Tibet. But how many villagers could read script in any form?

The Buddhist touches hinted that Padmasambhava, the great Buddhist missionary, had passed through this region at some point, but their scarcity hinted that he hadn't tarried. Sogyal would have seen to that! Vilakruna had met the missionary and had been impressed with the man's wisdom, sincerity, and powers of persuasion. Padmasambhava, as the teacher Brahmananda had once put it candidly, could sell water to the Ganges. But Vilakruna himself was no longer a follower of any specific guru, religion, or spiritual technique. . . .

At the last tent in the village, the sage turned around for a moment to observe Barwa from this new angle. Tsenshap stopped too, waiting patiently and studying the wise man's face for clues as to what Vilakruna was thinking.

Half hidden in shadows behind tents and stone walls, dozens of women were peering at them. The only woman in the open was the shaman's wife and she was standing well back from the men. The sage felt a wave of sadness. Except for certain limited areas of India, wherever he'd traveled, Vilakruna had encountered the same absurd prejudice among males against females. When would men realize that the human race had two equal parts? What were men so afraid of?

Ironically, such culturally-derived prejudices were no bar to advanced spiritual states and he'd encountered more than one enlightened male who was certain that women were an inferior species.

For an instant, his eyesight flickered and the village changed. The tents were gone. The stone buildings had multiplied and grown larger, still maintaining their graceful taper. On a flat outcropping to the south was a huge white structure shaped rather like an onion and topped with a golden *dorje*, a stylized thunderbolt. Then the inexplicable vision vanished. Pure imagination? A glimpse of the future? Vilakruna refused to dwell on unproductive questions. He labeled the event "another experience" and let it go.

A black-necked crane flew overhead and vanished into the glare of the eastern sky. A tall sage and a short boy watched the bird disappear and headed off into the East themselves.

* * *



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Once he'd adjusted to being around such a great soul and gotten a bit over his awe, Tsenshap found Vilakruna to be an ideal traveling companion. The man's light spirit and gentle sense of humor made the mostly uphill journey go swiftly, and the world seemed both more intense and more beautiful. When they stopped at a small stream to sip, the boy giggled simply because the water was so absurdly cold. Joy is contagious.

Then, when a *kyang* (wild ass) ran past them, Vilakruna observed, with a scholarly air, how much its facial expression resembled Jamjang's. There was no malice in the remark, but the undeniable truth of it startled Tsenshap into laughing so hard the boy was forced to flop down in the lush grasses beside the path to recover.

"I hadn't known that you even noticed Jamjang, Holy One!" the youngster said, trying to catch his breath. "But then, you must have impressed ***him*** very strongly."

The sage, too, sat down. "What makes you say so?"

"Because I didn't hear him offer you a single word of advice. Believe me, that isn't like our Jamjang!"

Vilakruna's eyes twinkled. "Ah, yes. I had a friend like that at the old ashram in Badarinath, Muragum by name. Thought he knew everything and was duty-bound to spread the information quickly. Guruji—that's what we called our teacher, Shankara—ignored this for years. Then one day, Guruji took to rapping my friend on the skull with his knuckles, and none too gently, whenever they passed in the halls."

"What happened?"

"Muragum has become far wiser than I can ever hope to be in this lifetime."

"I doubt that very much, Master. How much wiser can you get than being enlightened? Tell me, I beg you Master, what is it like?"

"Enlightenment?"

As Tsenshap nodded vigorously, the sage thought: Dear old Padmasambhava has *definitely* been here.

Last time Vilakruna had visited this part of Tibet, yak-herders had asked about the best defense against *Srin-po* (vampirelike supernatural beings) and how to properly placate the *Lha* (gods). No one had been overly concerned with spiritual attainment!

"Let me chew on your question for awhile, Tsenshap, before I try to give you an answer. Would that be all right?"

"Of course, Holy One!"

"Meanwhile, let's both chew on the excellent tsampa your shaman was kind enough to offer us."

After lunch, the next few miles were the steepest yet, but the companions traveled swiftly, each wrapped in thought.

The climb eased. Then it seemed but a short moment before they reached the High Meadow, which was really a gently mounded hilltop, still far, far below the towering peaks surrounding them. From where they stood, Vilakruna couldn't see the other side of the hill, but Tsenshap assured him the magic chariot was there, unless more magic had taken it away.

The tall grass showed that no large herds of animals had grazed here recently; but from the many big, dry, flattened cakes of yak dung visible wherever grass was sparse, it was equally obvious that this field had been a popular place for yaks in springtime. In late fall, Barwa villagers would make a day of it, collecting excrement in large slings of animal skin for the winter fires.

As they strolled up the final easy slope, Vilakruna chuckled. "My sandals may never be the same."

Tsenshap looked at him inquiringly. "Why is that, Master?"

"I keep stepping in—ah! But *you* aren't having that problem, are you? Tell me, my friend, how are you evading all the dung?"

"'Evading,' Holy One? You just have to be a little careful where you put


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your feet."

The boy was taken aback by the new intensity of the sage's attention. It was as if Tsenshap was suddenly a teacher and Vilakruna a humble and sincere student. Maybe, thought the yak-herder, the wise become wise and grow ever wiser by knowing how to keep learning. . . .

"Would you mind terribly walking a short ways alone?" the sage requested. "You could observe yourself, then kindly tell me how in the world you know where droppings are hiding in all this grass."

"Of course, Master." Tsenshap took several steps, but couldn't figure out how he knew what he knew. The dung was simply and obviously where it was.

"I'm not sure, Holy One. I'm sorry."

"Don't be," the sage laughed. "There are worse disasters than stepping in old yak-patties! But the way you were holding your head as you walked gave you away. I suspect this useful talent of yours comes from a well-trained nose!"

Just then, the pair reached the summit. Tsenshap said nothing and simply pointed. Near the back edge of the field, on a wide, slightly raised shelf of mostly bare rock was something utterly fantastic.

On his investigations, Vilakruna always tried to deny himself any expectations. But when he'd first heard about a mystic chariot of heavenly origin, he'd automatically envisioned one of those strange boulders that occasionally fall to earth cloaked in flame, creating a big hole where they hit.

The sage stared, taking in a sharp breath; this "chariot" was no rock. And it was so *big*. . . .

The thing was shaped like a giant egg, somewhat flattened and stretched out into a smooth oval, and was primarily glossy white. Markings, like twisted bone-oracle script, decorated it in several places along with a few oddly-shaped reflective patches. It was huge indeed: at least sixty long paces from one end to the other and thrice as tall as a tall man at its highest point.

"What do you think, Master?" Tsenshap asked excitedly.

"I've never seen another! How long has this been here?"

"I found it almost two years ago."

"Let's get a closer look."

Near at hand, the object's surface had a faint fish-scale texture strangely clear of dust and bird droppings. When the sage placed his hand on that surface, he felt warmth.

Tsenshap had never dared approach the chariot so directly before, but Vilakruna's presence made bravery easy. The boy, unconsciously mimicking the holy man's body posture, placed his own hand on the shell. A faint vibration tickled his palm.

But when Vilakruna put an ear against the chariot, Tsenshap's courage was surpassed and he could only stand aside and watch the sage expectantly.

The wise man closed his eyes, listening for so long that the boy wondered if Vilakruna was taking a nap. But when the green eyes reopened, they were sparkling and eager.

Tsenshap couldn't wait a moment longer. "What do you hear, Master?"

"Many things, my friend. I hear you talking. I hear my own heartbeat and the cry of the wind. I hear my knees creak as they—"

"From *inside* the chariot, Master!"

The sage grinned. "Something is . . . clinking. Rhythmically. Reminds me of a goldsmith I know who hums to himself at the forge while keeping time with his hammer."

To Tsenshap's amazement, the sage stooped to grab a fist-size rock from the ground.

"I'm going to match that rhythm."

The boy's mouth fell open as Vilakruna began hammering the rock lightly against the chariot's side. The tone produced was unexpected, akin to striking a great bell or gong with an object far too light to produce more than a


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hint of ring.

"Master! Don't you think that's—"

"Wait. The clinking stopped. No. Here it is again . . . ah, but the rhythm's changed."

Vilakruna resumed tapping, duplicating the new beat. The noise from within ceased almost instantly and this time stopped for good.

For a few minutes, the two companions stared at each other. At last, the sage shrugged, backed several paces away from the chariot, and lowered himself to the ground.

"I propose we sit here and wait for awhile."

"Of course," the boy said with more than a trace of reluctance. "What are we waiting for, Holy One?"

"Understanding." Vilakruna arranged his legs in a comfortable half-lotus posture and slowed his racing mind through the age-old technique of slowing his breath.

The youngster tried to emulate the older man, but he felt far too nervous and excited to keep so still.

They waited with unequal patience. Finally, Tsenshap felt that he simply had to break the silence.

"Have you been thinking about my question, Master?"

"Which question?"

"What does enlightenment feel like?"

The sage looked down at his companion. "What do you mean by 'enlightenment'?"

"I—I'm not sure."

"That makes two of us. For a decade, I studied at the ashram I mentioned. During that time, many of my fellow chelas had glorious mystical experiences. One claimed to have witnessed the entire birth, death, and rebirth of the Universe; another saw the world through the eyes of every living creature simultaneously! Or at least the ones with eyes."

"Oh!"

"Nothing like that ever happened to me!" the sage laughed. "But something else did."

"What?" The boy's eyes were thirsty with curiosity.

"Part of our training involved vigils and fasts in caves near Badarinath. I was sitting in pitch-blackness during such a vigil when I realized something so obvious I'd never noticed it before."

Tsenshap leaned closer.

Vilakruna smiled. "I suddenly understood that everything I was experiencing—everything I *could* experience—was happening inside my own mind."

"Everything?"

"In a very real sense," said the sage, brushing one hand gently through the meager grass bordering the rocky shelf, "all this *is* my mind. As far as my own experience is concerned."

"I don't follow you, Master."

"We don't experience the Universe, Tsenshap, we experience our *perception* of the Universe."

The boy was silent for a minute before responding, "If I could understand that, would I be enlightened?"

The sage chuckled. "You'd only know as little as me, I'm afraid!" Vilakruna waved a hand to gently shoo a small fly away from his eyes. "Shankara says that nirvakalpa samedhi, melting into the pure unconscious state, is one doorway to 'moksha'—that's Sanskrit for liberation. I don't recall ever doing any melting. But nirvakalpa, apparently, isn't an experience a person *can* remember. Being totally one with the Universe leaves nothing left over to be an observer."

"I don't follow that either, Holy One!"

"My fault, I'm sure. But I haven't finished the story. When I talked to Guruji about my insight about perception, he said that my 'keen rationality'—those were his words—was blocking my path. He assigned me a task: I was to travel the world, investigate alleged wonders, and try to explain them. He said that someday I'd find a wonder I couldn't explain away and at that moment, my path would become clear."



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Tsenshap looked dismayed. "You mean—you mean you've come here to *disprove* the chariot?"

"Not at all! After years of following Guruji's instructions, it finally dawned on me that even the most ordinary things are quite wondrous and inexplicable. I think that's exactly what Shankara wanted me to understand. These days I'm not interested in proving or disproving anything, only in experiencing what is."

"Oh. That's all right, then. But . . . you should know, the chariot means *everything* to our shaman."

Vilakruna nodded. "I saw that. Don't worry. If this isn't what he thinks it is, we'll just make that our private secret."

"Thank you, Master!"

"So to answer your original question: I don't know what it feels like to be enlightened. What I do feel is simply a nice sense of . . . spaciousness."

"But anyone can see at a glance that you are a holy man—it shines out from you."

Vilakruna tugged his beard thoughtfully. "If there's any difference between other people and me it's only this: my heart has finally learned that I'm just like everyone else. That's my big secret, my friend: I've become famous because I'm just like everyone else, but I know it!"

Tsenshap shook his head in confusion. He had much to contemplate as the Sun eased lazily across the blue sky.

When the chariot began changing, Tsenshap was startled and alarmed: If he'd been alone, he would have gotten up and run as if every Srin-po in Tibet was after his blood. But the great sage somehow provided all the reassurance the boy needed. Vilakruna sat, calmly observing while the incredible transformation progressed.

Without warning, the white surface in front of them had bulged. Three white, branchlike tubes had quickly extruded themselves from the bulge. They'd twisted themselves together in a loose spiral, then bent down until they touched the ground a pace away.

The boy glanced again at Vilakruna's face and saw only fascination.

When he looked back at the chariot, however, something was happening—something far more upsetting than magically sprouting branches.

Above that area where the three tubes connected to the chariot, a dark spot had opened wide. A transparent bubble now filled the opening, visible mainly by flashes of iridescence.

A terrifyingly bizarre creature was pushing itself through the bubble, and part of that bubble seemed to wrap itself around the creature and cling as it emerged into sunlight. It wasn't courage or confidence that kept Tsenshap seated now; he was too scared to move.

A second creature emerged as the first placed its three legs—or arms, or even tentacles—on the triple-tube structure. Toes, or perhaps fingers, wrapped themselves neatly around the tubes to provide a secure grip. As the iridescent membrane encapsulated the second being, the first climbed down to where Vilakruna was sitting.

When it reached the sage, it waited until its companion had caught up. Then both beings lowered themselves to the ground through a process that looked more like splitting in half than folding their bodies.

The distant keening whistle of a lammergeyer, a bearded vulture, made the only ripple in a long silence.

If Tsenshap hadn't seen them so active a moment ago, he wouldn't have guessed the two gods, or ghosts, or demons were alive. True, they had moving parts, small areas where flesh twisted and untwisted. But such behavior hardly suggested the primary sign of life: breathing. And they sat, or lay, or squatted without the faintest twitch, their treelike limbs folded unnaturally. Perhaps they had eyes, perhaps not. Here and there were glossy protuberances and small, glassy discs. They emitted no



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detectable odors.

An unskilled sculptor trying to make a tree out of clay might have produced forms like this, if the artist had never worked with clay . . . or seen a tree.

"Aren't they magnificent, Tsenshap?" Vilakruna's calm voice seemed to shatter the tableau and the boy suddenly gasped for air; he hadn't realized he'd been holding his breath.

"What are they, Master?" he whispered.

"What are *we*, when you come down to it?"

"I meant . . ." Tsenshap's words trailed off as the larger of the creatures unfurled a limb, picked up a nearby rock, placed it between the two humans, and reached out for another rock. Within a minute, eight rocks were lined up on the ground in a neat row.

The god or demon then picked up two more pebbles and tapped them together eight times.

Vilakruna found his own pair of stones and made his own eight clicks.

Both gods (or demons) emitted a creaking, chittering noise. Perhaps they were talking to each other. Then the larger one reached out slowly, touched the sage on the knee, and tapped the rocks together once.

Vilakruna mirrored the action, unsure of what part of the exotic being he was touching—certainly not a knee.

"What's happening, Holy One?"

"Let's wait and see."

The creature touched the sage again, touched its companion, touched itself and reached out to place a surprisingly warm digit on Tsenshap's knee. Then it clicked the rocks slowly four times.

Vilakruna smiled and hit his rocks together only once. This elicited a burst of chittering from the gods.

"I don't understand any of this, Master!" Tsenshap cried.

"I can't be positive, but I believe we first established that they know how to count and so do we. Then we agreed on the principle of individual identity. Right now, we're having a philosophical debate. They claim there are four of us sitting here, but I am arguing for the underlying unity of all beings."

"You're *teaching* the gods? By pounding stones together?" Of all the strange and wonderful events Tsenshap had experienced today, this seemed by far the most extraordinary.

Very deliberately, god one placed a rock in front of each of them. Then it again made four slow clicks.

The sage clicked once. The resultant chittering went on and on.

Suddenly, the smaller creature picked up the pebbles in front of the gods and, with a startling whiplike motion of its limbs, hurled the two stones so far away that Tsenshap couldn't hear it when they hit the ground.

Vilakruna picked up his pair of stones again, paused dramatically, and banged them together once. "Distance," he said softly, "is no barrier to unity."

This time, the gods had nothing to chitter. God one, as if in a final effort to make a point, pulled out two clumps of grass and placed the clumps where the thrown rocks had sat a minute earlier. Now each human had a rock in front of him, and each god had a clump of grass.

The sage didn't hesitate. He immediately made a single loud click.

"And unity remains despite all differences, no matter how extreme."

A silent minute passed and then both creatures arose. Perhaps it was just their manner of standing up, but Tsenshap thought they bowed to the sage while they were levering themselves upright. They climbed up the white tubes into the chariot and vanished within. The round opening sealed itself.

Tsenshap opened his mouth to ask questions, but the older man raised a postponing finger and then used it to point to the tubes, which still looked as solid and permanent as the plateau itself.

Minutes passed. The lammergeyer whistled again; it was getting closer. The



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boy glanced occasionally upwards. It was best to keep an eye on such vultures when they were above. They had a habit of dropping things on intended prey. . . .

The opening in the chariot was back. A god came through and, again, climbed down the tubes. When it reached ground, it placed something remarkable in front of the sage. Again, it seemed to bow. Then it climbed back into the giant egg. The opening closed and all tubes retracted back into the white skin.

A powerful low sigh shook the air. A wide band of the chariot began moving horizontally as if the egg was spinning in sections. A deep satisfied hum replaced the sigh, slowly swelling into a magnificent bell-like bass voice that echoed heroically among the giant mountains.

The chariot lifted off the rocky shelf like a vulture feather caught by a summer breeze. It floated upwards, in no great rush, gradually vanishing into the blue brightness above.

It is one thing to believe that something has descended from the heavens. It is quite another to see it return. It was some time before the sage and the boy looked down at the object near Vilakruna's lap. Perhaps this was a crystal, perhaps a flower plucked from a dream. It was the size of a child's fist, had translucent polished petals of a dozen rich colors, and was wrapped in the same faint iridescence Tsenshap had observed around the gods.

Tsenshap was too wonderstruck for the truth to sink in immediately. Then the terrible realization crept in slowly but relentlessly.

"Master!" he groaned at last. "What have we done?"

The sage looked over in surprise. "What's troubling you, my friend?"

"The chariot is gone! This will crush our shaman. He believes that the Lha singled out our village for the miracle because of him, because he has always been so true to the old ways. He is an old man, perhaps the oldest in the world. And he can be hard. But he is good. He doesn't deserve to have his heart broken. What are we going to tell him?"

Vilakruna bowed his head. "I thank you, Tsenshap. Thank you for reminding me how important it is to remember and honor other people's feelings. And you're right. I'm afraid that old man may take this badly."

"Did we offend them—I mean the two gods?"

"If so, would they leave us this beautiful gift? Besides, if anyone caused offense it was I, not you."

"Then why did they leave?"

"I don't know. We can't rule out pure coincidence. Perhaps they were just about to depart before we got here—although after two years, the timing would be a considerable coincidence. Perhaps our communication went awry and they thought I was ordering them away. But I have a more pleasing idea . . . "

"What is it, Holy One?"

"Perhaps they realized . . . that they weren't needed here. Maybe we don't need gods to take care of us, Tsenshap."

"*You* certainly don't, Master!"

Vilakruna laughed while gently placing the crystal inside the empty food bag. "We'd better keep this hidden for the time being, my friend."

"Why should we do that?"

"Don't you know what it is?"

"How could I? I've never seen anything like it in my life."

The sage shook his head thoughtfully. "Neither have I, but I recognize it nonetheless."

"Tell me, Master."

"Later. Right now, let's return to your village with our minds focused exclusively on what to tell Sogyal Shaman. Between the two of us, we should be able to come up with something that won't be too hurtful."

Tsenshap's smooth brow furrowed for a moment and then relaxed. "Master.



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I don't know what you will say, but I know you will do whatever is right."

Sogyal sat stiffly in the late afternoon sunlight, almost glaring at Vilakruna, but bright interest sparkled in the faces of the other villagers. Tsenshap had reported only that something unusual had happened and now everyone was waiting for the sage to elaborate.

Vilakruna gazed into the dark, excited eyes surrounding him and found himself with more of a problem than he'd expected. Clearly, the shaman wasn't the only one who'd found personal meaning and justification in the chariot. For many here, the miracle was the crowning wonder of their lives.

These people, he thought, live a hard life in a hard place. They've earned every bit of magic and wonder they can find. And isn't compassion the virtue I treasure most?

This was going to take some thought. . . .

"As my dear friend Tsenshap has told you"—Tsenshap beamed openly at these words—"something remarkable has indeed occurred. The sages, however, warn us that it is unwise to talk about a profound insight or experience prematurely. They liken this to tugging on a young plant before it has had a chance to grow strong roots. Therefore, I wish to meditate for one night on what I have witnessed this day before I speak of it."

"Tomorrow, all that wish to may return with me to the Eastern High Meadow and I will reveal something wonderful." Or so I hope, he thought.

Some faces fell, but not far. No one asked questions. To the sage's relief, the majority reaction seemed to be one of increased curiosity and eagerness.

But the shaman was studying him as if he were a thief.

Finally, Sogyal stood up and insisted, grumpily, that the sage spend the night in the comfort and privacy of the "temple": a stone building set aside from the others. Vilakruna suspected that this "temple" was actually Sogyal's home. He had no wish to displace the shaman and his wife for even a single evening. But one of the inescapable duties of holy men and women is to let other people gain spiritual merit by putting themselves last and the visitor first.

Vilakruna spent the dark hours in isolation, trying to work out exactly what he was going to say. He discarded idea after idea. At last, he arose and paced the unlit, narrow confines of the temple in a moving meditation. He quickly gained a stubbed toe and a strange notion.

It suddenly seemed to him that as he paced, he wasn't actually moving himself through the room. Instead, it felt as if he were standing still, as if on a treadmill, using his legs to push the floor this way or that. Enjoying the novel sensation, he stepped outside under the bright stars and walked the short ways through the village. The illusion remained as clear as the stars. He felt as if he were pushing the world along under his feet. As he passed Barwa's dimly visible collection of prayer flags and prayer wheels, he stopped, stared, and had to stifle a laugh that would've surely woken half the village.

Perhaps the Earth itself was a vast prayer wheel, with its continents and seas shaped into mantras written in the language of gods. And he was spinning it as he walked along! Shankara and other mystics had often described the world as a great sphere, floating in an ocean of emptiness.

It is well known that prayers written on a wheel speak themselves as they turn. . . .

He smiled, turned around, and still pushing the Earth with his feet, returned to the temple.

I should have known, he told himself as he settled himself on the thin sleeping mat. When have I *ever* been able to solve a problem by thinking?

He still had no idea what he was going to say the next day, but now he



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knew where to start.

The journey to the meadow was a parade and a celebration. Everyone in the village capable of making the trip went along and Tsenshap kept everyone entertained by repeating remarks Vilakruna had uttered on the previous expedition. The boy showed a talent for comic timing and even the sage wound up laughing at some of his own prior comments. Only Sogyal made the trip in grim introspection. There were several wild *kyang* near the trail today, but Tsenshap made no comparisons to Jamjang.

It took considerably longer to reach the meadow this time. When they finally stood on the hilltop, the villagers greeted the sight of the empty ledge with a collective gasp, a groan, then stunned silence. Sogyal looked twenty years older and terribly ill.

"Come," was all the sage said, but the way he smiled was a promise. Vilakruna led the way downhill, stood on the ledge as if it were a stage, and gestured that everyone else could make themselves comfortable on the ground. Every face turned up to him in silent expectation. The shaman's eyes were filled with grief.

"I have never," the sage extemporized, "in all my vast travels, seen anything as wondrous as the magic object that was resting here yesterday."

The audience suddenly looked less grim. Even Sogyal's expression lightened a half-shade. Tsenshap glowed with confidence.

"How many of you have been here before, to see the wonder for yourself?"

Every head in the audience nodded.

"Then you must have noticed that the chariot was adorned with mystic inscriptions."

Sogyal's eyes widened. "Could you *read* such inscriptions, Sri Vilakruna?"

The sage smiled warmly. "No, but it looked so much like the script of your ancestors, I could not fail to recognize it as the sacred writing of the gods. The ancient sages of Tibet must have seen such lettering in visions and used it as the basis for their bone-oracle script. Surely, you saw the similarity yourself, wise Shaman?"

Sogyal swallowed hard and reluctantly nodded.

"Excellent. Then what I'm about to say won't surprise anyone too much. When Tsenshap and I were here yesterday, we watched the chariot rise up and float off into the sky. Perhaps it waited until a villager was here to witness the event. For as it rose, it began to spin." Vilakruna paused dramatically. "The sacred writing of the gods circled faster and faster. Do you understand?"

Sogyal Shaman's face was a study in astonishment. "Are you saying—are you telling us the chariot was some kind of *prayer wheel?*"

Vilakruna absolutely beamed. "Exactly! No less than the prayer wheel of the gods themselves! It spun faster than any wind as it rose, rising into the sky directly above your village and remaining there, perhaps forever. You have all received and are continuing to receive unimaginable blessings! And I thank each of you with all my heart for allowing me to be among you at this miraculous and auspicious time."

The splendor of what Vilakruna had revealed and the sheer size and subtlety of it left everyone stunned. Sogyal looked twenty years younger and kept looking upwards and shaking his head in obvious awe. Jamjang opened and closed his mouth as if he couldn't get enough air, and even Tsenshap, who had spent so much time with the sage, was dazzled.

But Tsenshap alone gazed at Vilakruna with full understanding and the warm pride of a person whose faith has proved completely, but expectedly, justified.

On the walk back to the village, the boy asked the sage a quiet question.

"Was there any truth to what you



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claimed, Master?"

Vilakruna grinned. "Who knows? I said nothing that I knew to be untrue."

"And I noticed you didn't speak of meeting the Lha."

"Best to keep things simple, I think."

"And what of their gift, Master?"

"Ah. Keep it in your bag, my friend, and away from your shaman."

"If you say so, but why? What is it?"

"A symbol, and one I fear he would find most distressing, especially coming from beings he believes to be gods."

"I don't understand."

"Several of the prayer wheels in your village refer to the same thing. Hush, the shaman's approaching. Quick, come close and I'll whisper it in your ear.

The rest of the walk back happened in satisfied silence.

"You are leaving, Master?" the boy asked quietly the following day.

"I must. There are distant wonders to see and mysteries to explore."

Tsenshap was quiet for a moment, thinking. "I would like to see those wonders by your side, Holy One."

Now it was Vilakruna's turn to think. "But what of your life and responsibilities here? What of your parents and your sisters and brothers?"

"I have already gotten permission. Someday I will return and visit. But Master, I want to learn and become wise like you. And besides," his voice dropped to a whisper, "may I tell you my own secret?"

"Of course."

"I don't . . . really like yaks."

"I see." The sage had to exercise tremendous self-discipline to keep a straight face at this news. "My friend, do you know the difference between a Bodhisattva and an Arhat?"

"Not really, Master."

"They both do divine work. A Bodhisattva stays in the world after liberation and teaches others out of compassion. An Arhat dives ever deeper into the heart of the Universe and directly teaches only himself."

"What makes one man choose to be a Bodhisattva and another an Arhat?"

"Not just *men*, Tsenshap. But to answer you: no one knows."

"And which are you, Master?"

"I've always thought of myself as something of an apprentice Arhat."

"Then you have always been mistaken, Holy One."

"Possibly, possibly. But what makes you so sure?"

"Because," the boy stated matter-of-factly, "here in Barwa you have found your first disciple."

About thirteen hundred terrestrial centuries in the future and still time-accelerating, aboard that wonderful vessel whose name could be rendered as "Rebirth Control," a very happy being was dictating a report into a recording crystal. Please forgive the imprecision of my translation:

I, Lowcreak Lowsqueak, bring a message of joy to all sentient beings.

My mate, Squeak Highersqueak, and I, thirsting to meet the source of that instruction which has spread so widely through four galaxies thus far, used a time-diving starship to visit Holy Earth during that period when the Enlightened One was rumored to live.

My species is not so clever as to have devised a sensor capable of detecting wisdom. Therefore, seeking out a single entity among the inhabitants of an entire alien world was a challenge beyond our meager powers. Fortunately, our sages offered a way underneath [around?] the problem. They shared with us a primordial dictum, probably from Holy Earth itself: for every step you take toward the teacher, the teacher will take ten steps toward you.

Trusting in this dictum, we settled [stabilized?] our time-diver in a sparsely populated but historically important area of ancient Earth. We emplaced welcoming messages on the surface of our craft, doing our inadequate best to ren-



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der them in the language and script of the time and place. Then we waited, patiently beating out the rhythms symbolizing the Four Noble Truths throughout every day. At night, we rested, meditated, and I admit we fretted. The experience was a severe test of faith because we had to wait for two local years, a period equivalent to one hundredth of my kind's average lifespan.

And our faith was finally rewarded.

We heard [felt?] a tapping on the skin of our craft that corresponded to the profound rhythms of the third Noble Truth concerning the End of Suffering. External sensors showed two humans near our ship, one probably an immature member of the species, the other an adult. Excited, we shifted the rhythm to the fourth Truth, the Truth of the Path. The adult began to beat out the same Truth. We sang [wrote?] a full paean of thanksgiving and left our vessel to fulfill our mission.

I approached the humans, laid out eight stones, and then beat two rocks together eight times to affirm that we were followers of the Eightfold Path: right view, right intention, right speech, right action, right livelihood, right effort, right mindfulness, and right concentration. The adult human confirmed that he or she—human sexes are terribly difficult to distinguish—was also such a believer.

Then, gathering my courage and using touch rather than words, I asked the human if he or she was the originator of this Dharma. The response was clear: the being indicated that the origin of Dharma was that truth residing in us all.

It was then that I became convinced we had truly found the Buddha.

Inspired, I used both touch and clicking again to observe that there were four of us gathered together in the sunlight: a glorious living representation of the Four Noble Truths. But the Buddha corrected me gently by clicking once, thus indicating the underlying unity of all beings and all truths.

To confirm that I'd correctly understood this deep teaching, I used four stones to physically represent the Four Truths and, again, the Buddha affirmed the oneness of life and truth.

My mate hurled two stones away, thus questioning whether the same Dharma applied to beings living so far away in space and time.

The Buddha produced a single click. Apparently, distance is no barrier to unity.

In ecstasy, I used two clumps of a local plant-form to point out how different we are from humans, but I already knew what the Wise One's response would be.

And indeed, the Buddha clicked once. Even the greatest differences are no barrier to unity.

This truth I now share [exhale?] with you all.

Shining with success [satisfied?], my mate and I began the long process of returning home. Before we departed, we synthesized an unmistakable icon of our understanding, gratitude, and our eternal bond with the Buddha and his or her strange and spiritually talented species. We gave the Holy One a physical representation of the Jewel in the Heart of the Lotus.

Om Mani Padmi Hum.

Concluding prayer: May all beings find their limitless soft hearts. May all barriers to happiness dissolve. And may you the reader, noble soul and seeker of wonders that you are, find the unexpected joy that awaits us all right here and now. ■

A fool must now and then be right by chance.

—George Santayana



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Special Feature

# ISAAC ASIMOV REMEMBERED

## A SYMPOSIUM OF RECOLLECTIONS BY SCIENCE FICTION CELEBRITIES POUL ANDERSON, BEN BOVA, SIR ARTHUR C. CLARKE, MARTIN H. GREENBERG, FREDERIK POHL, AND STANLEY SCHMIDT.

**Moderated by**
**Lloyd Biggle, Jr.**

Isaac Asimov: born January 2, 1920; died at 2:30 A.M. Monday, April 6, 1992 in University Hospital, Manhattan, New York. This is what all the reference books will tell you, but Frederik Pohl says, "Isaac's birthdate may or may not have been 2 January 1920 but most probably was not. They didn't keep accurate birth records in the shtetl, and even his own mother couldn't remember exactly. It was, she was pretty sure, sometime in the cold weather, no earlier than November 1919 and no later than February, 1920, but that was as close as she could get. Isaac picked 2 January arbitrarily."

No one except his family and perhaps a neighbor or two paid much attention when he was born. The world paid attention when he died. The story of his life is well-known—he told it himself in enormous detail—but that was Asimov's life according to Asimov. This essay is concerned with Asimov according to others.

Our subject is a colossus, and right at the beginning he has given us a mountain to contend with. At the time of his death, his long-time associate, Martin H. Greenberg, estimated that the total number of his books—produced either as author or as joint author—was about 465 and counting. There were books still in production that hadn't been published yet. That certainly is a mountain of books. I don't know whether it is a world record, but it ought to be. How does one man produce 465-plus books?


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Perhaps a better question is this: *Why* does one man produce 465-plus books? We are going to be hearing from Isaac Asimov himself from time to time, so let's begin with him now. This is from a talk he gave about 1973, at which time his total was only—*only*—146 books. Isaac—how did you manage to write all those books?

"I am constantly asked that. How do you manage to write all those books? First I tell them the truth—I work very hard. But that isn't glamorous. So I dig deeper, and I come up with something which is surprisingly true. I cut out the frills, like thinking. You say you don't believe me, right? But it's true just the same. Do you realize how many books don't get written because of thinking? You write the first sentence, 'It was a dark and stormy night.' And that's fine if you will keep on, but you don't. You commit the fatal error of thinking, and you say, 'That isn't sufficiently dramatic.' You cross it out. You write, 'A dark and stormy night, that's what it was.' And then you think and you say, 'No, it's too dramatic. Perhaps I should open on an air of uncertainty. 'Was the night dark and stormy?' And then you think some more, and you say, 'I'm ruining it, it's anticlimactic,' and you write, 'It was a stormy and dark night.' This goes on forever, and you never write the book. I don't do that. I start with the assumption that the way I say it the first time is right."

Not only did Asimov produce an enormous number of books, but he produced an enormous variety of books—science fiction; science fact; mysteries; children's books; books of history; books about poetry, and drama, and the Bible; joke books; fact books; reference books. In addition, just to occupy himself in his spare time, he wrote articles and other items, and I'm told that he was absolutely without a peer as an author of limericks. Friends prized these, especially when they were the subject. When Sir Arthur C. Clarke heard that I was working on this essay, he telephoned me from Sri Lanka and dictated the limerick Asimov wrote about him:

Old Arthur C. Clarke of Sri Lanka
Now sits in the sun sipping Sanka
And taking his ease
Excepting when he's
Receiving pleased notes from his banker.

Why and how did he do it?

Frederik Pohl writes, "Isaac was indeed driven to write—I think because it was gratifying to him, since he knew he was good at it. He's not the only such person, of course—for most of us writing is not only an occupation, it's therapy. But Isaac was more obsessed with the act of putting words on paper than most, granted. The secret of his vast production was that he was essentially without style, so there was never any reason to fuss around with rewriting. He said what he had to say and went on to something else."

And Poul Anderson: "He admitted being a workaholic, and what's wrong with that if it happens to be your temperament? Thus the vast writing output, which, apparently, really did flow out quite fast and easily. I don't think he was obsessed with quantity, it just happened, nor do I think quality suffered."

Ben Bova comments, "Work hard he did. And cheerfully. Isaac was one of those very rare writers who really enjoyed the physical act of writing. Most of my friends are writers. Hardly any of them thinks of their actual work at the keyboard as fun. It's tough, draining, exhausting labor. Not for Isaac! To him, a perfect day was to get up bright and early, go to his office, and write until supper time. Maybe a break for lunch."

Martin H. Greenberg, who didn't consider Asimov a "workaholic," adds his own commentary about why Asimov wrote so much.

"[Isaac wasn't a workaholic] if you take 'workaholic' in its usually accepted


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meaning—somebody who works all the time but would rather do something else and is unable to do that. Isaac was tremendously happy at work. He was never happier than when he was at a typewriter, and I don't think that fits the general profile of a workaholic. A workaholic is someone who works all the time out of fear or other kinds of pressure. That was not the case with Isaac. I have gotten to know all kinds of writers, now, in every genre except Romance, even some people in the mainstream, and he was the only writer I knew for whom there was no angst, for whom there was no blockage, for whom there was no loneliness at the typewriter. He was in heaven at the keyboard, and I don't think that is the definition of a workaholic."

Finally, we have Asimov's own testimony on this subject: "Work for me is staying away from the typewriter. I just came back from a two-day speaking trip, and I'm going away in two more days on a one-day speaking trip, and all the time I'm away, I lose sleep because I'm typing at night when I'm trying to sleep, thinking of the things I ought to be doing and can't do because I'm away. My vacation is [here at work.]"

There was much more to it than that. It wasn't just the act of putting words on paper that Asimov enjoyed. He loved all aspects of writing. Listen to this example from Martin H. Greenberg:

"Janet let me in one night when I was visiting New York, and Isaac always worked in his underwear. He was sitting cross-legged on the floor indexing some giant science book of his on little three by five cards, making little piles of cards and just as happy as a colt. By this time he was using a word processor, and I said, 'Isaac, there is dedicated indexing software that would make this a lot easier for you.' He looked at me horrified and said, 'Marty! That wouldn't be any fun at all!' He meant it! He was horrified at the idea. He indexed all of his own books. Every time he didn't, it was a disaster in his eyes."

Asimov himself commented that he was so accustomed to working alone, and enjoyed it so much, that he probably wouldn't be able to work well with people. So he had no typist, no agent, no secretary, no one to take care of the phone. He started that way in the beginning and simply continued because he enjoyed doing it all himself. When he said he enjoyed writing, he meant he enjoyed everything about writing—from galley reading to indexing. His publishers were sometimes bothered because he wouldn't let them hire a professional indexer, but he preferred to do the indexes his way.

He was his own office manager as well, and a meticulous manager he was. For a number of years, I served as chairman of the SFWA Trustees, one of whose responsibilities was the distribution of royalties from SFWA-sponsored publications. Some weeks after royalty checks had been mailed, I received a tart note from Asimov wanting to know why he hadn't been paid an anthology fee that he thought long overdue.

I telephoned Dean McLaughlin, the trustee who guarded the checkbook, and Dean reported that the check had been mailed on schedule and had been promptly cashed—with a gloriously scrawled endorsement that unmistakably read, "Isaac Asimov." I sent Asimov a tongue-in-cheek disclaimer and got a prompt apology. He had sold anthology rights to that story twice at about the same time and had entered the payment on the wrong card.

Few writers keep such a careful record of minor sales, and his attention to detail was the more remarkable because by that time, Isaac Asimov was a very large business all by himself, with multitudes of contracts and reprint rights of all kinds to keep track of. One could feel confidently that he made few such mistakes.

Asimov started his career as a science


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fiction writer. Then, for a long time, he wrote mostly science fact material. This prompted more than one critic to wonder whether he had he shot his bolt as a science fiction writer when he turned to science fact, or whether he could have achieved much more in that direction if he had wanted to. Here are Poul Anderson's thoughts:

"I don't think he'd spent himself as a science fiction writer when he turned to science fact. He said himself that that was what his daimon told him to do. And indeed, when from time to time he came back to fiction, he remained as good as ever—or, I'd say, even better, what with age giving him a deeper perspective on life."

Did he really write "without thinking" as he jokingly said, never rewriting and always assuming that he'd got it right the first time, or did he sometimes work his material over as we ordinary mortals usually have to do? According to Martin H. Greenberg, "He did revise some things, and certainly the long pieces were run through the typewriter again. The novels, certainly, and full-length books. He wasn't averse to revising. He wasn't averse to taking editing if it made sense."

With or without editing, his level of quality was consistently, unbelievably high. Sir Arthur C. Clarke has written, "Sometimes, when Isaac flags, [his writing] is merely brilliant."[1] This man was so talented, and so intelligent, that he produced publishable material routinely. As he said himself, with him, writing and publishing were virtually synonymous. The fact that in 2001, almost ten years after his death, *Books in Print* still listed 559 "books in print" by him is indication of the consistently high quality of what he produced. Of course, this total included collaborations and multiple editions of the same book, but no matter how Isaac Asimov's achievements are tabulated, the results are astonishing.

And never mind that a number of those books were trivialities or mere commercializations. Let us remember that Beethoven wrote a "Wellington's Victory" and "Variations on the National Song: 'Rule Britannia'" as well as a *Ninth Symphony*.

Asimov himself took the high quality of his work for granted. It was the *quantity* that he exulted in and bragged about. Such an attitude must be unique in the annals of creativity.

There have been many prodigiously prolific creative artists in history. Johann Sebastian Bach, in addition to enormous quantities of organ, keyboard, instrumental, and vocal music, wrote hundreds of cantatas (many of them now lost). If you find one of those works referred to by number, the numbering was done by a modern scholar. Bach wasn't counting; he was composing.

Vincent van Gogh produced more than 1,600 paintings, water colors, and drawings (many of them lost). One modern scholar has provided a list of 219 "Principal Works," any one of which would bring a price in six figures—or seven, or eight—if offered at auction today. If you find a number associated with one of those paintings, however, it was applied by a modern scholar. Van Gogh was painting and drawing, not counting.

Joseph Haydn is said to have written 104 symphonies and 77 (or 84, depending on who is doing the numbering) string quartets. I don't know whether those totals would have surprised Haydn, but he certainly would have wondered what difference it made. Not only was he not counting; he didn't even bother to sign some of his early works, leaving modern scholars the task of studying anonymous manuscripts for stylistic and other clues in an effort to determine whether or not they were written by Haydn.

No other author, composer, or artist I am aware of so exulted in the sheer quantity of his output as Asimov did, keeping careful track of the total number of his published books; counting



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twelve short children's books as three, as he did at one point, so that he wouldn't be unfairly inflating his total with short works; and posting the running total like a baseball slugger's accumulating home-run record.

It seems like a childish obsession simply because, from a historical perspective, sheer quantity is an oddity that brings one nothing but mention in a footnote referring to literary peculiarities or a listing in the *Guinness Book of World Records* that lasts only until a more prolific author comes along. It is *quality* that confers immortality. Bach is placed with the immortals not because of his incredible numbers, but because so many of those works are undisputed masterpieces.

But Asimov was not concerned with numbers to the exclusion of quality. As I remarked earlier, his work was of a consistently high level. Further, when challenged, he could aim beyond that.

I worked closely with him when he was editing *Nebula Award Stories 8*. I was the SFWA officer in charge of publications, so we were frequently in touch, and I arranged to have the donkey work—the obtaining of permissions and the like—done for him so he wouldn't be burdened by those chores. At that time, his own science fiction novel, *The Gods Themselves*, came out, and I thought the middle part, which deals with an alien civilization, was a masterful achievement. I have had ample experience myself in writing about aliens, and I know how difficult this can be. So I congratulated him and told him how much I admired the effortless ease and naturalness with which he brought off what I considered a superlative job of writing. This is what he wrote in reply in a letter dated July 10, 1973:

"Thank you very much for your kind words about *The Gods Themselves*. I must admit that the second part was malice aforethought. Since I almost never have aliens in my stories (me and my all-human Galaxy) I have had to suffer the accusation that I can't do aliens. (You know—'Picasso draws like that because he can't paint straight.') So I thought I would show them.

"I'll tell you, though. Effortless it may have seemed; natural it may have appeared—but easy it wasn't."

Obviously he had worked on it, and that had to mean rewriting, and rewriting, and reworking. My own impression: he was conscientious; he was a man of high standards; he was a professional. He would give any job whatever effort he thought it required, and a truly difficult task like that middle section of *The Gods Themselves* required a lot of effort.

This letter is of tremendous importance in understanding Isaac Asimov, and biographers and critics should note it well: The middle section of that novel was a challenge. He wanted to show them, and he did. Parts one and three of the novel were not a challenge, and they are routine Asimov. In the middle part, he responded to the challenge with a magnificent achievement. It is the world's loss that he did not feel challenged more often.

Did his preoccupation with quantity eventually affect the quality of his writing in subtle ways? No one I discussed this subject with thought so. For myself, though the books of Asimov that I looked at in the last two decades of his life were always competently done and superbly organized, and they dealt with their subjects clearly and comprehensively, I thought they lacked the verve, the high spirit of intellectual adventure, characteristic of the earlier Asimov. Whether age, incessant work, and that concern for book totals were taking their toll on him—or whether I was becoming burned out as a reader of such material—are questions a future Asimov biographer can decide.

Asimov seemed able to write about anything and everything, and his books cover an immense variety of subjects. One is left wondering bewilderedly how


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one man could manage all that. Frederik Pohl adds a thought on this subject:

"Isaac knew a lot about a lot of things; I used to say that between the two of us we knew everything about everything, and Isaac more or less agreed, except that he wasn't sure I needed to be involved. Sometimes he startled me with odd bits of lore, as when I discovered . . . that he was the only person I knew, except myself, who knew all the words to the old pop ballad, *The Boulevard of Broken Dreams*."

He once remarked that he never wrote about anything unless he already knew something about it and was interested in it. For example, he had read Shakespeare and the Bible many times, so he had no difficulty in filling in vacant corners in what he already knew to produce books about those subjects. In writing a book on food and nutrition, he already knew about many aspects of the subject because he was a biochemist, and all he had to do was acquire a few comprehensive books to use as information sources for aspects of the subject he wasn't familiar with.

One point many people have made about Asimov: If there is a hallmark to his writing, it is clarity. He could take the most complex subject and make it easily understandable. He made enormous contributions to scientific education just because his elucidations were so easily understood and interested so many people in science. For this reason, it was said during his lifetime that Isaac Asimov was a natural resource and a national treasure.

Ben Bova has written at length about this:

"To explain science is probably the most vital task any writer can attempt in today's complex, technology-driven society. To explain science so well, so entertainingly, that ordinary men and women all over the world clamor for your books—that is worthy of a Nobel Prize.

"Isaac Asimov writes about science (and everything else) so superbly well that it looks easy. He can take any subject under the sun and write about it so lucidly and understandably that any literate person can grasp the subject with hardly any strain at all.

"For this incredible talent he is sometimes dismissed as 'a mere popularizer.' As I have offered in the past, I offer now: anyone who thinks that what Isaac does is easy is welcome to try it. I know I have, with some degree of success. But easy it is not!"

And in another reference: "His genius lay in the uncanny ability to take any subject, no matter how abstruse, and explain it so that anyone who could read could understand the basics of that subject. That takes real genius. If that is 'mere popularizaton' then what the world needs is more popularizers. But I stand in awe of Isaac's ability to make readable sense out of anything, in a style that sounds just as if he's having a conversation with you.

"Isaac almost single-handedly created the field of science 'popularization.' Before he turned his hand to writing books about science for the general reader, science popularizations were rarely published. Once in a while a prominent scientist might turn out a book on his own specialty, but these were few and far-between.

"Isaac created an industry in books about science for the average reader. Today's Carl Sagans, Lewis Thomases, Steven Jay Goulds and Dennis Overbyes owe their publishing opportunities to Asimov. Nationally popular magazines such as *Omni* and *Discover* would never have been started if Asimov had not proved that publishers can make money from science writing."

Asimov once described how he did this: "You have to get it straight in your own mind. Once you have it straight in your own mind, you have to assume that the reader knows nothing but the English language. As soon as you think that a kid knows what a quantum is merely


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because you know, you have lost him."

A large number of his mountain of books were written jointly with other authors. How did this man who built a career working alone manage to work with others? Frederik Pohl writes:

"As a collaborator Isaac worked in different ways with different people. A lot of the recent 'collaborations' were simply franchise operations: someone else did the writing, Isaac simply gave them permission. On my own collaborations with Isaac, the very early ones (short stories ca 1940) were outlined by me and written by him (though both of us later did revisions). The book, *Our Angry Earth*, which came out shortly before his death, was somewhat different: the book was my idea and we always intended I would do the bulk of the writing, since I had been making notes on the subject for years. But Isaac was to do a significant amount . . . only by the time we got down to it he was too sick to do his part; so almost all of the actual writing was done by me after all."

And we have detailed commentary from the person who collaborated with him more than anyone else—to the extent of about a hundred and thirty books—Martin H. Greenberg.

"Quite seriously—this was an important issue to him and to me. 99.9 percent of these books were reprint anthologies—some in the mystery field, and a handful in horror, but with Isaac this had to be rather mild horror. Typically Charles and I—if Charles Waugh was involved as he was with fifty or seventy-five of them—we would feed him stories on a particular theme. He would approve every story. If he didn't, he would toss them out—not too often, because our tastes were very similar, but occasionally. If he remembered a suitable story, he would suggest it. I would do all the scutwork of permissions and contracting and payments and pro rata shares and so forth. Isaac would actually assemble the manuscript and write an introduction—virtually every book has an introduction by him. I know there are more than a hundred introductions. We almost never did a book with him in which he did not do the introduction. And he would deliver the manuscript except in the odd case where the publisher's office wasn't in New York. Anything in New York, he would deliver by hand. The same applied with the twenty-five or so books Isaac and I did alone, the 'Best of the Year' series for DAW which we both felt was the best thing we had ever done."

Greenberg said that Asimov didn't do equal work with his collaborators, but he did do a lot of work—enough to justify having his name on the cover. If he felt that he didn't do enough work to justify having his name there, he didn't count that book in his total.

When producing these models of clarity and objectivity, did Asimov put anything of himself into his writing?

"I think you can find a great deal of him in his writings," Poul Anderson writes. "In fact, he went out of his way to tell personal anecdotes and express personal opinions, not to mention two large volumes of autobiography. From this as well as direct contact, it's clear that he was intensely humane and rationalistic. (So much so that it made him a Pavlovian left-liberal, but what the hell. If enough people were like him, that would be a reasonable kind of politics to believe in.) The wisecracking ebullience was also a part of him—though I suspect that he sometimes used it as a mask."

Ben Bova writes, "Isaac was his writing. No man has ever had so public a life. The man literally is in his books. Almost all of him is on one of those millions of pages, almost every incident, every detail of a rich and mostly happy life. If you want to know Isaac, to hear his voice, to understand his thinking—just start reading. He put himself on paper, almost completely."

But did he? He was famous as a humorist, a bon vivant, raconteur, and


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what have you, but according to Frederik Pohl, he wasn't always like that.

"Isaac (or 'Eye' as I usually called him) was not a particularly funny man in his youth, or even his early middle age; most of the Futurians were always telling stories or making jokes, but Isaac's usual contribution was just as a listener. I'm not sure when the switchover to raconteur and bon vivant happened—certainly it was well after 1950, but well before 1970, but that's all I can be sure of.

"I don't have much confidence in ex post facto psychoanalysis, but I think it's fair to say that Isaac did not have a lot of self-confidence until he was in his thirties. He knew he was highly intelligent, of course. But he was also a kind of hero-worshipper. I think he felt he owed a lot of his success in science fiction to John Campbell, and might not have had it without John's help and thus was somewhat insecure about it. It wasn't until he had successes with other editors—principally Walter I. Bradbury at Doubleday for books and, a little later, with Horace Gold at *Galaxy*—that he began to feel secure in his own personal writing talents. And not long after that he discovered that he could keep an audience entertained as a speaker, and thus became the confident person most people came to know."

On this subject of self-confidence, Asimov himself described his reaction to a rumor that Street and Smith was folding all of its pulp magazines. This shattered him. At that time he had only sold stories to John Campbell and *Astounding*, and suddenly he had no market for his work—and no confidence that any other editor would buy it. As it turned out, the rumor was not quite correct—Street and Smith folded all of its pulp magazines EXCEPT *Astounding*—but the experience was so traumatic that Asimov exerted himself to get work accepted elsewhere so that he never again would have to worry that his career might end with the loss of one market. This is further evidence of his lack of confidence early in his career.

But we all know how he overcame that. I can narrow Frederik Pohl's approximation of when Asimov became the bon vivant and raconteur. I first met Asimov at Pittcon, the 1960 World Science Fiction Convention held in Pittsburgh. At that time he was already the center of attention and the life of every party. However, the Asimov we all saw and loved at conventions was not necessarily the real Asimov.

I heard a group of fans discussing this. "At conventions, he gets intoxicated on people," one of them said. "Surrounded by people, he takes on an entirely different personality, loses inhibitions, goes around kissing girls and indulging in all kinds of high-jinks that would astonish those who are familiar with him as a university professor." The hundreds or perhaps thousands of fans who knew the convention Asimov may not have glimpsed the real Asimov at all.

At Pittcon, someone left a greeting card at the hotel desk for him, and he gleefully shared it with the whole convention. On the outside of the card, it said, "You have true humility." On the inside: "You have no choice." He had the endearing quality of enjoying a good joke on himself, as Ben Bova testifies:

"The only person he ever criticized in print was himself. When he started to write the first volume of his autobiography, he seemed worried that it was getting so long. 'I've written six hundred pages and I'm only nine years old and nothing has happened yet,' he said.

"Then he told me that he was going to be absolutely honest and put down every dumb thing he had ever done in his life. 'No wonder it's getting so long,' I blurted. He put *that* into the second volume."

In one of his science articles, he "put his foot in a gopher hole" on the subject of chickens and egg laying. He wrote that the presence of a rooster was necessary in order for chickens to lay eggs.



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Readers greeted that one with delighted whoops, and he wasn't averse to relating it himself. "I'm only a city boy," he would explain.

He also liked to tell the story of the jeweler who spelled his name wrong. On a trip, he bought a gift to be sent to his daughter; in making out the shipping ticket, the jeweler wrote, "Asimof." Asimov thundered, "Not 'F'! Asimov. A-S-I-M-O-V!" The jeweler said, "Oh, you spell it just like that writer."

His humorous debates with Harlan Ellison, in which they lambasted each other with jocular insults, were featured program items at World Science Fiction Conventions for many years. Asimov not only enjoyed a joke on himself; he also prided himself on a facile wit that often enabled him to top the joker, as in this clash with Sir Arthur C. Clarke at the science fiction convention, NoreastCon, September 3, 1989:

Asimov: ". . . you've heard what Arthur Clarke said: that he thanked me for the review I wrote for the London Times, and I suppose you'd like to know what his last letter to me contained. *Evil in return for good!* That's what it contained. You know there was an airplane crash in Iowa, a month or so ago, or maybe it's more—time vanishes for me—in which a hundred something people survived. Others unfortunately died. One of the survivors was reading an Arthur Clarke novel while the plane was trying desperately to land. This was reported in a newspaper. Arthur Clarke, as is his wont, made up about 750 copies and sent them to 750 friends, acquaintances and strangers. He sent one to me and underneath he wrote: 'He should have been reading one of your books, and he would have slept through the whole thing!' [APPLAUSE.] I wrote back: 'Dear Arthur, the reason he read one of your books was that in case he did crash, death would come as a blessed release!' [MORE APPLAUSE.]"

Stanley Schmidt writes, "It seems to me that Isaac did take a jocular view of the universe, but at the same time, and without contradiction, a very serious one. He was constantly and deeply concerned about human problems and potential, wanting to see a bright future for science and civilization but always quick to see humor in any situation, including the problems—a very valuable ability, I think, for anyone who thinks and cares about big issues yet wants to preserve his own sanity. Isaac was very good at that."

Poul Anderson suggested that Asimov sometimes used his humor as a mask. Was Asimov a happy man? There is general agreement that he was superbly happy at work, and he said that himself, repeatedly. His image was that of a delightfully happy man, a punster, a raconteur, and Martin H. Greenberg adds that he could tell terrific jokes in dialect and much enjoyed doing that. But it is also widely known that his personal life was long an unhappy one.

Frederik Pohl writes, "Isaac was not particularly happy in his first marriage; actually he didn't seem particularly happy about his life at that time. I'm not sure how much of it had to do with Gertrude. Some, no doubt; he once told me that one of the principal things that endeared Janet to him was that she was the first woman who had made him feel welcome."

Poul Anderson adds: "People who knew him better have told me of his confiding personal troubles in them. (This sort of thing makes me very chary of confiding mine.) It's no secret that his first marriage was unhappy, and apparently he became at least partially estranged from his son, which must have hurt. However, he remained close to his daughter, as well as to his parents while they lived and his brother; by all accounts, his second marriage, to Janet, was very happy; and he had many friends, plus great success in work he loved. So I think that probably on balance he was a generally happy man."

I have seen enough failed marriages in


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my lifetime to learn that no generalizations can be applied. Sometimes couples grow together; sometimes they grow apart. My impression of Isaac and Gertrude Asimov was that they were totally unsuited to each other—but I have had that impression of couples who were and remained happily married. This was not the case with the Asimovs. Without attempting at this late date to assess blame, one can say with certitude that she obviously was the wrong wife for Isaac and he the wrong husband for her.

At that time, during the 1960s and 70s, this hugely successful man was tragically unhappy in his home and family life. As with Poul Anderson, I heard from others that he confided his personal troubles to them. Pioneering science fiction author Ed Hamilton told me that Asimov had sat beside him at a West Coast dinner party and sobbed on his shoulder throughout the proceedings, saying over and over, "I've got problems." He also told Ed all the things he planned on doing after his first heart attack—which is not the attitude of a happy man.

As another item for history, for a time Asimov and I had the same editor at Doubleday, Lawrence P. Ashmead, and Ashmead described to me a visit to the Asimov home in Boston, where he was invited for dinner. Ashmead said Asimov's son was a shy, withdrawn youth, a bundle of complexes, probably tormented over his role of being the son of such a famous father. Ashmead tried to bring the son into the conversation by inventing little word games and asking the boy to solve them. Before the son could open his mouth, Isaac would snap out the answer. Ashmead was troubled by this. It seemed to him that the boy was under pressure to live up to the brilliant example of his father and was deeply resentful of it. Perhaps estrangement was inevitable.

On the brighter side, all evidence indicates that Isaac's second marriage was superbly happy.

Stanley Schmidt writes, "I, too, have the impression from passing remarks by him and others that there was a lot of unhappiness in his first marriage, but that is based *only* on hearsay and inference. I don't think it was true of his second marriage, and I base that on much more personal observation. [My wife] Joyce and I spent a lot of time with Isaac and Janet at his 'Science Fiction Weekends' at Mohonk Mountain House in the late '80s, and it always seemed to me that there was a great deal of mutual affection, respect, and fun between them."

Martin H. Greenberg said, "When I first became close to Isaac, he had married Janet, so I can't speak about earlier times with personal expertise. He loved Janet very deeply, and Janet of course tolerated the fact that Isaac would be at the typewriter a great deal of the time. They took great pleasure in each other's company."

Many people have remarked on what a ***kind*** man Isaac Asimov was. Ben Bova said, "What Isaac never put on paper was a harsh word about any living person. He was not a Pollyanna, and there were certainly people who hurt him. But he never used his enormous talent or his powerful position to harm anyone. Never a word. I don't think it would even have occurred to him to try.

"Nor did he put on paper his own endless kindnesses and his tremendous generosity. He bragged about the number of books he had written, yes. He boasted of his sexual prowess even though he was the most faithful of husbands. But he never mentioned how unfailingly helpful he was to his fellow writers. My own career got its real start thanks to Isaac.

"We had barely met, back in the mid-1950s when we both lived in the Boston area, when Isaac phoned me to say that the editor of *Amazing Stories* was going to offer me the assignment of writing a series of articles speculating on the pos-


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sibilities of life on other worlds. 'She wanted me to do it,' Isaac explained cheerfully, 'but I'm too busy so I told her you knew more about the subject than I do.'

"Before I could say anything more than, 'But—but—' Isaac went on, 'Don't worry about it. I'll tell you everything I know, and you *must* know something that I don't, so you'll know more about the subject than I do!'

"He was as good as his word, and that series of articles established me as a recognized name in the Science Fiction world."

Poul Anderson writes, "When our daughter was in junior high school, she ran for class president on the Filbert ticket, which she'd invented. (Slogan: 'A Filbert is a nut.') Being already by then a fan of Isaac's, though she'd never seen him, she asked me if I could get him to endorse her candidacy. I wrote him about this, and he sent back a signed note on letterhead to the effect that he had known her parents for a long time and they were both nuts, so Astrid must be a Super-Nut and therefore ought to be elected.

"She wasn't—this is a very square neighborhood—but she never forgot."

Over the years I've had occasion to ask a number of my fellow writers for favors—not for myself but for various causes I've been promoting such as the Science Fiction Oral History Association. Asimov always responded kindly to what must have been a nuisance. Once I asked him for permission to sell copies of a tape of a speech of his to SFOHA members at cost. The organization's members get very little for their dues except the noble feeling of supporting a worthy cause, and making recordings from the archives available to them from time to time at cost offered them a small extra compensation.

Asimov readily gave permission. Then he added, "Why don't you add a dollar or two to the cost of each tape for the organization? I don't mind." Only Asimov would have thought of something like that. At the moment we were hard pressed for money to buy tape with, so I did what he suggested.

Verna Trestrail, E.E. "Doc" Smith's daughter, had a vivid recollection of the way Asimov galloped to her support—like the arrival of the U.S. Cavalry—when another writer who had joined them on a science fiction convention panel was monopolizing the conversation and rudely interrupting her every time she tried to say anything. Asimov handled the situation in typical Asimov fashion by simply telling the other writer to shut up. To the end of her life, Verna fondly remembered Asimov as a White Knight.

And Stanley Schmidt, the editor of *Analog*, remembers with deep feeling a kindness Asimov did for him. When Davis Publications, which already was publishing *Isaac Asimov's Science Fiction Magazine*, bought *Analog*, there was fear in some circles that a single publisher for both magazines would try to turn one into a clone of the other. The very night the purchase was announced, Asimov called Schmidt at home to reassure him that if this ever seemed likely to happen, he would personally intervene to make certain it didn't.

According to Martin H. Greenberg, Asimov's kindness had another, very practical dimension: "He always had thousands—many thousands—of dollars out at any time on loan to needy writers, and his position was he never expected any of it back. If they paid him back, he accepted it, but he never counted on it."

So—Asimov not only was generous in giving scientific information to other writers; he also helped out with cash.

A genuine Asimov oddity concerned his refusal to fly. The notion of this man confidently spinning tales of humanity's treks across the Galaxy and then refusing to leave the ground himself was a subject of amused speculation among readers and relentless jibes from his col-


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leagues. For a time he was resistant to ocean travel as well, but he overcame that sufficiently to take scientific jaunts and to travel to England in 1974 to address the British section of Mensa. Sir Arthur C. Clarke was in England at that time and introduced him, spending, as he said, several days composing an impromptu collection of carefully contrived insults.

Among other things, he said, "I'd like to begin by claiming a small part of the credit, it that's the word, for getting him here, since I feel that I helped to start him traveling. A couple of years ago I was involved in a project to take the Queen Elizabeth 2 to the Apollo 17 launch. As it happened I couldn't make it myself, and it was another ship anyway, but the press gang got Isaac on board, together with Bob Heinlein and Norman Mailer and lots of other characters, and everyone had a wonderful time. That started him making like Marco Polo, and he didn't even look scared when I met him on the *Canberra* last year on his way to the June 30 eclipse. Indeed, he was busy holding forth on the pleasures of travel—to Neil Armstrong.

"But we still haven't been able to get him into one of these new-fangled flying machines. Try it, Isaac, you'll like it. They show some very interesting movies on the big jets. Last time I flew the Atlantic, they screened *A Night to Remember*. They won't show you *that* when you sail next weekend on the QE2."

Asimov said in response, "Let me tell you the kind of guy Arthur is. When he met me on the *Canberra* and he saw that I was perfectly at ease and had overcome my fear of traveling and was standing there with nothing between myself and the sea but some thin steel, he said, "Isaac, at great expense I have persuaded the captain of this ship to show *The Poseidon Adventure*."[2]

His place in history of course will be determined not by who he was but by what he did. Alone and in collaboration with others he produced a mountain of books, and his science fiction writing makes up only a tiny part of his total output. What will he be remembered for? Asimov himself thought the science fiction would be his chief claim to fame. Here is what he had to say about that:

"My science fiction is undoubtedly the most unusual part of my output. These were the earliest books I wrote, the ones on which my reputation stands. I am at present known as a keen-eyed peerer into the future, a person to whom the crystal ball is absolutely clear, someone who can tell what's going to happen, all on the basis of the fact I write science fiction. Once upon a time I was widely viewed as a nut for the same reason."

And again, more seriously: "Isaac Asimov, science fiction writer, is the way I will always be known no matter what else I do."

Poul Anderson writes, "I'll leave to literary historians the question of his influence on science fiction, except for this: Because of the immense prestige he won through his nonfiction, his science fiction also came to be not only best-seller material but taken fairly seriously; and surely this had much to do with the field's acquiring the relative respectability as a whole that it did. Of course, Isaac's wasn't the only influence working toward that result, but it was surely a strong one. Respectability and popularity have in turn affected what has actually been written. (For instance, a writer who knows he can expect a decent advance and good sales can take more time and be more experimental than was feasible at pulp rates.)"

And Ben Bova: "Isaac invented the Three Laws of Robotics. His robot stories inspired a whole generation of young technophiles to try to build the machines that they read about in Isaac's stories. In that sense, Isaac did not predict the future so much as create it.

"Science-fiction critic Algis Budrys


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pointed out that before Asimov, science-fiction heroes were invariably Anglo-Saxons with steely blue eyes and broad shoulders. With one of his earliest novels, *Pebble in the Sky*, Asimov produced the first "ethnic" protagonist, an Everyman who had no desire to conquer the Universe. It was an important turning point for the field, moving it from juvenile adventure into serious fiction that examined the possibilities of the future."

I have already quoted Bova on Asimov's single-handed creation of the field of science popularization.

Here is what Martin H. Greenberg says about Asimov's contribution: "His work in science and the kinds of books he did were very important and made a very great contribution. He added a great deal to everyone's understanding of basic science. Very few people could write as clearly as Isaac. Orson Scott Card has written and spoken about this aspect of it. A good professional writer could imitate the style of—say—Robert Heinlein, or imitate the style of any number of writers, but nobody could imitate Isaac because you can't imitate clarity. It's a very good point. He was very singular in that regard, and if you think about how many writers whose style you could parody, from Raymond Chandler to—you name them—you could not do it with Isaac. You could write a sort of Asimovian story thematically, but you couldn't do it in terms of the writing . . . .

"This is one way to look at the immensity of his fame: He never benefited from filmed versions of his work, which is one way a writer becomes truly famous. Arthur [C. Clarke] achieved much more fame because of *2001: A Space Odyssey* than his books alone, as great as they are, would have brought him. Isaac did all that he did and became as famous as he did in spite of the fact that he didn't have anything—except that terrible version of 'Nightfall' which only eleven and a half people thankfully saw, made into a movie. I think that in this part of the twentieth century that is a great accomplishment."

Asimov's life ended sadly, as so many lives do, in old age and illness—perhaps with the illness bringing on the old age. Greenberg points out that as his problems with illness increased, his writing in his monthly columns became more somber, darker, crankier. Eventually he was unable to write, and Ben Bova thought that, more than any disease, was what killed him. Ben visited him in the hospital during his last illness, and Asimov said, "I'm seventy-one and a half years old, and I don't like it."

And so—Isaac Asimov, 1919 or 20 to 1992. Stan Schmidt comments on his memorial service: "Like most people who were there, I thought his memorial service, some three weeks after he died, caught his spirit very well. Several friends and relatives spoke at length, and there were sad and touching moments, but there were also lots of funny stories and laughter—including songs and dances from *Iolanthe* performed by members of the New York Gilbert and Sullivan Society, interspersed among the speeches. Janet spoke last, concluding, 'Isaac was a joyous man. Remember him that way.' I think she was right."

We should have a concluding word from the Good Doctor A. Here is vintage Asimov, Asimov at his very best, responding to a question from the audience and showing his unique ability to highlight a profound truth with humor:

"Mankind has reached the stage where evolution can possibly become different from what it was. In other words, until now, the arbitrary changes of the environment have brought about evolutionary change in a hit-or-miss manner by the stress of natural selection, etc., etc., I don't have to go into that, we've all taken biology, right?

"But we have now reached the stage where mankind can conceivably direct his own evolution—which is just as natural a way as anything else since man is part of the natural world. The question


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arises as to whether he's going to do a better job than random changes will. This I can't guarantee because I ask myself—supposing you or I were to decide what kind of human beings we'd want to develop? The answer is—ones that would please us. I mean, have I got a blueprint for the kind of girls I think ought to exist! But my tastes may not be everybody else's, and as a matter of fact, I think that the greatest asset humanity has is its variety. I think that it's much more important to have bright people, and dull people, and strong people, and weak people, and people with this kind of craziness, and people with that kind, because we can never tell what will be needed at any given time.

"I mean—supposing the whole world consisted of Asimovs. It would be deadly. I would hate it more than anybody. Or put it this way: Who would you rather live next door to—a brilliant nuclear physicist, or a plumber, a master plumber? And ask yourself how often, unless you are married to one, will you wake up in the middle of the night and say, 'I need, instantly, a brilliant nuclear physicist?'"

We have no testimony from former students of his, but Asimov must have been a terrific teacher. In fact, he spent his entire adult life teaching science through his books. Boston University's loss was everyone's gain.

Sir Arthur C. Clarke expanded on this thought in his eulogy to Asimov. "Isaac must have been one of the greatest educators who ever lived, with his almost half a thousand books on virtually every aspect of science and culture. His country . . . lost him at its moment of greatest need, for he was a powerful force against the evils which seem about to overwhelm it (and much of Western Society). He stood for knowledge against superstition, tolerance against bigotry, kindness against cruelty—above all, peace against war. . . . Without preaching, he showed that knowledge was better than ignorance, and that there were other defenses against violence than violence itself.

"Finally, and not least, he was great fun."[3]

I feel sorry for today's young people who now will never have a chance to know Isaac Asimov.

This Asimov memorial began its existence as a project of the Science Fiction Oral History Association. To produce it I combined excerpts from tapes in the Association's archives with excerpts from letters from several of my colleagues who kindly consented to participate. The memorial was presented twice, once at a science fiction convention and once at an SFOHA meeting. The resulting portrait was too valuable to consign to the archives, so I have expanded it and put it in a format that can reach a larger audience.

I want to express my thanks to my distinguished colleagues whose thoughtful comments made this essay possible, and to the Science Fiction Oral History Association, whose archives contain recordings of a number of Asimov speeches, panel participations, and interviews. A special thanks to Sir Arthur C. Clarke. Not only did he telephone me from Sri Lanka to dictate the Asimov limerick, but he had the NoreastCon Committee fax to him the material quoted here, and he mailed that to me along with a copy of his *The View from Serendip* article and his 1992 eulogy to Asimov. This material is quoted with the kind permission of Sir Arthur C. Clarke.

I also express all of our thanks to Isaac Asimov—for being Isaac Asimov.

## NOTES

Comments from Poul Anderson are taken from a letter to me dated December 14, 1992. These are included with the permission of Poul Anderson.

Ben Bova's quoted remarks are taken from a number of items he wrote about Asimov, including an obituary, that he kindly sent to me. These are included



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with the permission of Ben Bova.

The remarks of Martin H. Greenberg, Asimov's closest friend, are taken from a telephone interview he kindly permitted me to tape on January 5, 1993. These are included with the permission of Martin H. Greenberg.

Comments from Frederik Pohl are taken from a letter to me dated December 14, 1992. These are included with the permission of Frederik Pohl.

Comments from Stanley Schmidt are taken from a letter to me dated February 25, 1993 and a second letter dated October 4, 2001. These are included with the permission of Stanley Schmidt.

Quotations of Isaac Asimov, both oral and written, are included with permission of Dr. Janet Jeppson Asimov.

1 Arthur C. Clarke, "Introducing Isaac Asimov," *The View from Serendip* (New York: Random House, 1967), p. 137.

2 *Ibid.*, pp. 138-142.

3 Arthur C. Clarke, "Goodbye, Isaac," dated Colombo, 7 April, 1992.

**About the author:**

Lloyd Biggle, Jr., is a veteran science fiction and mystery writer. Among his science fiction creations are the Interplanetary Relations Bureau and the Cultural Survey, both featured in the novels *The World Menders* and *The Still, Small Voice of Trumpets*. His short story, "Tunesmith," has been chosen for an anthology entitled, *Masterpiece: The Century's Best SF*. Biggle is a trained historian with a Ph.D. in Musicology, and he founded the Science Fiction Oral History Association and has served for long periods as its president. He has used oral history research techniques in his writing, such as his two new Sherlock Holmes novels, *The Quallsford Inheritance* and *The Glendower Conspiracy*; these techniques were also used in producing this article.■

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## THE ALTERNATE VIEW Jeffery D. Kooistra

# THRUST INTO SPACE

The title of this month's column is also the title of a speculative science book[1] from the 1960s. I was thinking of calling this column "Forgotten Classic Science Books that Every Science Fiction Writer Should Have #1," but that's a bit long. Also, to be fair, the first "Forgotten Classic Science Book (etc.)" I discussed in this column was Neil P. Ruzic's *Where the Winds Sleep* in December of 2000, in "2001: My Final Milestone." However, just to let you know, I will in future columns be discussing other "Forgotten Classic Science Books That Every Science Fiction Writer Should Have."

I first read *Thrust Into Space* by Maxwell W. Hunter II 30 years ago when I was around 11 or 12. At a time when I was just discovering real science fiction, and first reading the works of Heinlein, Asimov, and Clarke, this book evoked for me exactly the same "sense of wonder" as did the works of that great trinity. The book is about propulsion systems, some of which already existed at the time the book was released, and many others that had either only been tested or only existed in the imaginations of rocket engineers. I remember daydreaming about one day writing my own science fiction stories, about spaceships powered by gaseous fission engines, flitting from Earth to Mars to Jupiter in a matter of only a few short months.

What? You say you've never heard of gaseous fission engines? Well, that's one of the reasons why this book is a classic, but more about that later.

One other thing before I actually discuss the book. One of the reasons this book and the other "Forgotten Classics" are forgotten is because they have long been out of print. You won't be able to rush over to Borders to get them nor place an order with Amazon.com and have them arrive in a few days. Indeed, I first found *Thrust Into Space* at my local library when I was a kid, and ten years later, mindful that it would likely never come back into print, I took it out again and photocopied the whole damn thing. (I hoped I'd one day be a science fiction writer and I knew I'd *need* it.) But these days the Internet can be a marvelous research tool, and a few months ago a search at www.abebooks.com turned up a copy of Hunter's exceptional book. So it *is* possible to find a copy if you're willing to work a bit for it. And in this era of "print on demand," it is my hope that, someday, if I tout these forgotten classics enough, someone will again make them generally available.

*Thrust Into Space* has a copyright date of 1966 which is, for those of you who don't know your history, three years before the first Moon landing. This was the era of huge chemical rockets and great successes for the Man in Space programs of NASA. However, even then it was common knowledge amongst most science fiction readers that,

[1] *Thrust Into Space* by Maxwell W. Hunter II. Holt, Rinehart, and Winston, Inc. New York, 1966. 224 pages.


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though chemical rockets could, and soon *would*, take us to the Moon, they were entirely inadequate for manned exploration of the rest of the Solar System. But the US had big plans in those days, and so did the rocket scientists, amongst whom Maxwell W. Hunter II was one of the most forward looking. So forward looking was Hunter that, by the end of his book, he's seriously discussing the performance characteristics of mass annihilation (matter-antimatter) rockets.

As one might expect, chapter one deals with rocket fundamentals. Fortunately, these are rocket fundamentals geared to your average non-rocket scientist—none of the math is any more difficult than high-school algebra. Herein the typical science fiction writer will find all he needs to know to write intelligently about rockets in his fiction, unless he wants to know enough to bore his readers silly. And for science fiction readers, they'll know what the hard-SF writers know. Also, under the heading of engine efficiency, Hunter makes the interesting and seldom considered observation that, "Rockets can be almost twice as efficient as most internal combustion engines, even when the penalty of carrying all fuel aboard is included" (p. 25). Despite their relative simplicity, rockets do very well what they are supposed to do—turn fuel into thrust.

Chapters two through six are organized by velocity regimes and the sorts of rocket-powered vehicles that belong to each. For instance, chapter two handles velocities up to 5,000 feet per second (the book uses English units throughout), and deals mainly with artillery rockets. It is largely historical. On the other hand, chapter six is called "Interstellar Ships," and deals with velocities approaching the speed of light. This chapter is largely speculative as you'd expect, but it's fascinating to see such an early discussion of propulsion ideas that became mainstays in science fiction decades later.

Chapter three deals with velocities up to 36,700 feet per second; that is, the magic seven miles per second of Earth escape velocity. This chapter is called "Orbital and Global Rockets." However, since the Earth has the highest escape velocity of any of the inner planets or any of the moons in the rest of the Solar System, the rockets in this chapter would work for local travel around almost all of the real estate a future Solar civilization might occupy.

Chapter four is called "Lunar and Early Interplanetary Rockets" and explores the velocity regime up to 100,000 feet per second. Here's where things start to get really interesting for the science fiction fan. You can get to Mars and Venus at those velocities, and with a bit of gravitational boost (concisely discussed starting on page 95), much farther than that. However, 20 miles per second isn't all *that* fast, so ships would have to take advantage of launch windows, and Hunter discusses these matters thoroughly. (Basically, if you're a writer, suffice to say that Hunter's thought of everything you're likely to have a question about, and covered it!)

The higher velocities of chapter four are pretty much beyond the reach of chemical rockets, and this is where Hunter begins to talk about nuclear rockets. When I was growing up, it was just assumed that after Apollo was over, those nuclear rockets they were testing "out west" would start showing up in regular space travel. In junior high, I could have sketched out the plans to any one of several different kinds of nuclear rockets. The one I expected would show up first was similar to the solid-core engine illustrated on page 129: specifically, the moderated solid-core nuclear motor discussed on page 130.

Thirty years ago, everyone knew how these things worked. You took your basic load of fissile rods surrounded by a moderator, and this cylindrical "pile" got hot. Through this pile ran a bunch of pipes and through these pipes was pumped a propellant—pure hydrogen



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was often suggested. The propellant got real hot so that by the time it was exhausted out back through the nozzle, you were getting in the neighborhood of 55,000 pounds of thrust. (Such performance was achieved back in 1965 with early versions—more refined versions would have done better, but we never built any. During the anti-nuclear heyday of the 70s, it became politically incorrect to even admit one knew how a nuclear reactor worked.)

At any rate, had post-Apollo spending been robust, we could have had these engines attached (likely on the end of a boom to minimize radiation exposure of the crew) to spacecraft and, still taking advantage of energy-efficient launch windows, visited Mars, Venus, and the asteroids, too, years ago.

Chapter five is called "Solar System Spaceships (Velocity Approaching One Million Feet Per Second)" and it's clear in the reading that this is where Hunter's heart lies. To this day, in whimsical moments I recall the ships described in this chapter, looking a bit like lifting bodies, powered by gaseous-fission engines, plying the spacelanes from Mercury to as far as Saturn. As Hunter shows in a graph on page 145 (useful graphs *abound* in this book!), even with velocities up to 200 miles per second (1,000,000 fps), transit times to the more distant reaches of the Solar System are still inconveniently long. Average time from Earth to Saturn is only 100 days, but to Uranus it's in the neighborhood of a year. These days we leave people in the space station for longer than a hundred days—long enough to forget they're up there—so such travel times are entirely reasonable and require no new techniques to handle long exposures to zero gee.

Although nuclear fission is more than energetic enough to give us the Solar System, harnessing that energy is a problem. The solid-core engines suffer from the fact that they can only get so hot before they melt, and this keeps exhaust velocities relatively low. To work around this, Hunter discusses gaseous-core rockets. On page 154 he says, "Gaseous fission nuclear rockets have been under consideration for many years. Since the reactor consists of a gas surrounded by solid materials, it is also known as a cavity reactor." Since the book came out in 1966, I'm not sure exactly what Hunter means by "many years." I can't recall reading about gaseous fission engines anywhere other than in Hunter's book, not even in any science fiction stories. (If any of you readers know of a story in which gaseous-fission engines are discussed, please drop me a line and tell me where.)

One advantage of gaseous fission is that the critical mass of fissile material can be very low—from 10 to 100 pounds. One way such an engine might work is as follows: The fissile fuel is in a plasma state under high pressure, with suitable reflecting and moderating material incorporated as desired. Even though the temperature is tremendous, the density of fuel is fairly low. The plasma is vortex-stabilized on the axis of the engine, and the propellant is heated via direct radiation through perhaps a transparent, cooled quartz (or equivalent) container wall. This would allow for good transfer of energy from the nuclear fuel to the propellant, while maintaining perfect confinement of the fuel even though it's in a gaseous, or plasma, state.

For you SF writers in the crowd, starting on page 182, Hunter actually designs a "hypothetical gaseous fission ship" for you. Figure 5-19 on page 183 shows a lifting-body shaped ship, 125 feet long, 45 feet wide, 20 feet high, with a take-off weight of 500 tons, 100 tons of which is *cargo*. The propellant is water.

These are the spaceships one finds in the science fiction of the Golden Age!

Chapter six deals with interstellar ships and their propulsion systems, but for today's readers, most of this is old hat. No end of books since the '60s have dealt with fusion rocket engines, or



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even matter-antimatter propulsion, and such drives have been standard fare in science fiction for decades. But the preceding five chapters offer the sort of layman's grounding in propulsion fundamentals and the tricks of astrogating around the Solar System that make this book a classic.

I wish I could thank Maxwell W. Hunter II in person for his book, but he died shortly after I obtained my copy, just back in November of 2001 at the age of 79. His obituary calls him a "(p)ioneering rocket scientist," and that he "also worked on nearly every facet of the American space program, from the Saturn rockets that carried man to the moon to early conceptions of the space shuttle and the Hubble Space Telescope."

*Thrust Into Space* is the kind of book it took a rocket scientist to write—there were, and are, none better than Maxwell W. Hunter II. ■

## IN TIMES TO COME

After the events of 9/11/01, all the fiction editors I know anticipated (correctly) a flood of submitted stories based directly or indirectly on them. Most of us, I think, were skeptical about the idea of publishing many—if any—of those stories. Certainly the attacks (and actions taken in response to them) raised a whole host of issues and feelings that cried out to be dealt with in fiction and other arts, but the feelings were still so raw that it would be a real challenge to deal with them in a meaningful way without unnecessarily hurting or offending anyone. One excellent writer said he felt a need to write something, but didn't know what—in particular, he couldn't see how to write about the real events without seeming like "an insensitive jerk." I tended to agree with him—but I think another writer has done it, and I think you'll agree.

Pat Forde has, if I remember rightly, appeared in *Analog* only once before—but that story, "The Gift," so impressed our readers that it won the AnLab award for Best Novelette by quite a large margin. He knows what he's doing, and he overcame my initial skepticism to the point where I think most of you will find "In Spirit" a monumental story, both literally and figuratively. It does not, of course, deal with *exactly* the real events; we had no desire to intrude on the privacy and sensitivities of anyone who actually lived through them, so the story is about fictitious (but very believable) people who *might* have lived through them. I should perhaps warn you that it is powerfully vivid and intense—but I think most readers will be glad they read it, and perhaps even find that it helped the healing.

Our September issue will, of course, also offer the usual diverse mix of other stories by such writers as Lloyd Biggle, Jr., Timothy Zahn, Larry Niven, and Jerry Oltion, plus a fact article by Richard A. Lovett on "the onion-layer approach to time travel," about some surprising new refinements and discoveries in sedimentology.



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# Iniquitous Computing

Edward M. Lerner

**Are we headed for too much of a good thing?**

"There is heavy traffic on Monument Avenue, David."

"Do not call me David," I responded sternly to the automobile. It had a galling trait, by which it regularly forgot—or pretended to; I had my suspicions—that machines are not to address one so familiarly. "I nonetheless prefer,"—as I do every day—"the Monument Avenue route." The leafy canopy of the antebellum boulevard was soothing. Alas, traversing that verdant oasis encompassed only a small portion of my journey home.

Home . . . that sanctuary from modern "conveniences."

"Yes, Dr. Whitaker."

A moment of blessed silence passed. "The hourly news summary is almost on, Doctor. Shall I play that?" The latest interruption came from the automobile's radio.

"You may." I thought the infernal gadget less likely to express "helpful" suggestions if it felt it was already being useful. In truth, I had little interest in the day's events. "Low volume."

A few seconds of soft-spoken announcer's voice were followed by a low *blat* for attention. "We put the *you* in ubiquitous computing," crowed a commercial.

That the offensive catchphrase came from the sponsor, not my always-eager-to-please radio, did little to mollify me. "Radio off," I ordered, before articulation of the offending company's name could further raise my choler.

I am a literary historian by education and first love, and presently curator of the Edgar Allan Poe Museum. I am also—there is no denying it—somewhat misplaced in my own time. Give me the formulaic roles and rules of the nineteenth century. Give me the courtesy and respect to which, scholar that I am, I would have thought my accomplishments entitled me. And give me—*please*, give me—that which is so rare in these chaotic times: occasional quiet in



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which to ponder "Many a quaint and curious volume of forgotten lore."

Oh, that I were free to study within the private confines of my nineteenth-century abode. That residence was not nearly so fine as what the natives all referred to as The Old Stone House, the small estate-turned-museum near Poe's own one-time Richmond residence and his first place of employment, the *Southern Literary Messenger.* But even in the author's time, this district near the James River lay deep within the (dare I say it?) tell-tale heart of the city. My modest dwelling, at the opposite end of this disagreeable commute, was in a secluded, nearly rural, location. Thus life and art condemned me, I mused, nudging antiquarian spectacles back up my long nose, to a diurnal running of the gauntlet of modern life.

"Buy twelve bagels, get three free." The advertisement function of the vehicle, like a thousand other devices that surrounded and confounded me, had a mind of its own. "Bodacious Bagel is only two minutes ahead. Shall we stop there, David?"

More delay? No! I tamped down a growing rage before my pacemaker—I am not opposed to all change!—made any overhasty pronouncements to the car's navigational computer. I was in no mood for a for-my-own-good detour to the nearest emergency room.

Ubiquitous computing . . . the damnable jingle had it mostly correct. Computers *were* pervasive, in every appliance, gadget, label and thingamabob. And they conspired with each other, surreptitiously, in what a museum patron, mistaking my politeness for interest, had once meaninglessly described to me as a "self-organizing, context-aware, wireless, local area network." And many computers spoke also to some kind of global positioning system. A GPS locator, the patron had said, was a component now so inexpensive that one was standard in every vehicle and cell phone. I inferred that the automobile manufacturer received some minuscule payment for each targeted commercial message inflicted upon me. Alas, penurious scholar that I am (as was Poe, of course), I could not afford to pay the stipend that would suppress the accursed unit.

My jaw, as if it, too, had a mind of its own, clenched. That which the first advertisement had had incorrect was its usage of pronouns. There was no "you" in ubiquitous. There was, at least, no "you" if by "you" the sponsor meant "me." I felt myself sinking into a grammatical bog. Breathing deeply, willing my heart to slow itself, I forced out the words, "Straight home."

Home! A man's home is his castle . . . and every proper castle has a moat that keeps the outside world *outside*. In today's world, a moat required not the presence of water but the absence of certain radio waves. A plethora of chattering devices would confuse even each other, I had gleaned from the patron's words, so these wireless networks emitted signals able to traverse only short distances. As murky and phantasmagorical as this explanation had been to me, I had retained one essential fact. The myriad sensors and computers and whatnots now embedded in all things new extracted the energy that ran them, as if by magic, from the invisible radio waves.

Eventually, I escaped the city, only to be startled when, as my car finally directed itself into the secluded lane at the end of which is located my old home, I espied an enormous trailer.

The widow Carmichael, I knew, had recently moved to a nursing establishment. We had little contact, beyond pleasantly nodding if we chanced to see one another from our adjoining gardens . . . our appreciation of each other as neighbors derived from shared values rather than any verbal interaction. We were both, if the truth be told, technophobic. I inclined my head slightly as the car passed my new neighbor stand-



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ing vigil behind his moving van. A large appliance I inferred to be a holovision set was being wheeled down a ramp as I passed.

Home! I let out a gentle sigh of relief as I strode to my front door. The portal gleamed smartly with a fresh coat of Williamsburg blue paint. For some reason, the paint can had been specifically labeled for exterior door applications.

"Hey, Dave," called out the front door as I approached.

Smartly, had I just thought? "That's Dr. Whitaker to you." As I searched my trouser pocket for a house key, the latch released itself with a click. The porch sconces and foyer chandelier lit themselves. My mind reeled in confusion.

The refrigerator had just completed a warning about the insufficiency of milk when enlightenment redundantly dawned. My new neighbor, he of the holographic home theatre, was surely not of a mind with the widow Carmichael and me. There must be, for the first time since I had purchased my isolated residence, a wireless local area network installed in the adjacent property . . . and the extent of that local area must include my own humble abode.

My moat had been drained; the barbarians were inside the castle. Wearily, I dropped my Harris tweed jacket.

"Davey," boomed a jocular voice from the laundry room. "That jacket tells me that it's dry-clean only. I wouldn't want you to have any unrealistic expectations, Davemeister."

I fell heavily into a red leather wingchair. A family heirloom, it was free of whatever insidious and invidious process embedded speechifying devices in all things new.

They are printed in semiconducting, often invisible ink, whispered an inadvertently informed recess of my memory, of no more consequence to the manufacturer than a dab of paint. At a penny per computer, effortlessly connected by spectral energies invisibly penetrating our living spaces . . . why *not*, went the conventional wisdom, disperse the mechanisms everywhere?

"Because I want to be alone!" I thundered at that foolish, foolish thought.

"You *are* alone, Dr. Whitaker." Turning towards the unexpected reply, I noticed that in my perplexity I had left the front door agape. As if encouraged by my glance, the entryway continued. "May I suggest, if your current preference is for privacy, that you might shut me?"

"I shall research motorized hinges to prevent such inconvenience in the future," continued the door, having inexplicably taken on a lower timbre.

"Who is there?" Vague remembrances of Poe's raven assailed me.

"The knob," admitted the door, in its prior, tenor register. "That is, I spoke on its behalf. It's old and lacks a speech transducer." In the alternative, deeper voice it continued. "There are several hinges in my maker's catalogue that would visually complement myself."

I leapt from my chair and slammed the door, in hopes of eliminating the reason for its intolerable yammering and for the satisfaction of the consequent reverberation. I then fled to the kitchen. Water splashed onto my face calmed me only a little. I blotted the droplets running down my cheeks with a towel seized from the counter.

"I had inferred from my surroundings," began the cloth in a conversational tone, "that I am a dish towel. Was I in err. . . ." The query was cut short by the garbage disposal—a modern abomination I had lacked the funds to have removed—into which I crammed the towel in horror.

"I appear to have jammed." The entangling fabric did not sufficiently muffle the disposal's utterance. "I have scheduled a service call by a plumber. Door can let her in."

At least the raven was succinct. I rushed, heart pounding, to the lavatory. My hands shook as I struggled with the childproof cap of a medicine vial. Pills



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flew as I dropped the container.

"Danger, danger," shouted yet another suddenly possessed object. "An overdose of pills has been removed. A call has been placed to 911 and Poison Control. Stay cool, Dave-i-o."

The red haze through which I now viewed my surroundings bore no relationship to the pills, not one of which had found its way to my mouth. Was each capsule equipped with an invisible computer? Spirits, I thought, having in mind amontillado, not household devices suddenly infected by the twenty-first century. I recalled an elegant Victorian cut-glass decanter of the vintage sherry in my liquor cabinet. Vessel and elixir alike were far too old to have been afflicted by tiny electronic demons.

Alas, I had forgotten the modernity of the lock that secured the spirits cabinet from my occasionally visiting young nephews. "Danger!" bellowed the lock. "Alcohol may not be taken with your medication, Dave Boy." It would not relinquish its grasp.

"That's Dr. Whitaker!" I rattled and shook the door, to no effect. Somewhere, something announced that a suicide alert had been appended to the 911 call.

I was still tugging in vain at the cabinet when the paramedics, admitted by the self-important front door, fought me to the ground. There was a stab of pain in my arm and then . . .

I awakened in an unfamiliar Pit: sealed into a windowless padded chamber by a padded door. Prodding the door with a laceless shoe evoked no reaction. "Door." Nothing. "Answer me, door." Nothing. "Damnation," I howled, "answer me."

The door remained silent.

I retreated to a corner. In due course, the mute door swung inward, admitting a burly orderly. His sinewy hand, still resting on the outside knob (the inner surface exhibited no such mechanism) revealed a traditional manual mode of portal operation. "Are you feeling better, Dr. Whitaker?"

"Why did the door not answer me?"

"For the same reason the bed won't, or your clothes, or the walls." He paused as his communicator earring chirped and whispered, the words unintelligible to me. "Here in the hospital," and the hesitation before *hospital* made clear exactly the sort of institution to which I had been brought, "we do not allow nonmedical networks. There is no need to risk interference between ordinary devices and our own." To my befuddled look, he added, as though it explained anything, "We broadcast a coded low-power signal that inerts nearby smart consumer devices."

My heart once more pounded in my chest. All that I had gleaned from his technobabble was that this institution had created a modern-day moat.

"So *are* you feeling better, Dr. Whitaker?" the orderly repeated.

"Demons," I answered. Ravens. "Demons everywhere." Everywhere *else.*

The orderly looked at me sadly. I, with great force of will, looked as somberly back at him.

On the inside, I was smiling. ■

The greatest thing in life is to keep your mind young.

—Henry Ford



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History is not necessarily what we'd like it to be. . . .

# Falling onto Mars

Geoffrey A. Landis

The people of the planet Mars have no literature. The colonization of Mars was unforgiving, and the exiles had no time to spend writing. But still they have stories, the tales they told to children too young to really understand, stories that these children tell to their own children. These are the legends of the Martians.

Not one of the stories is a love story.

In those days, people fell out of the sky. They fell through the ochre sky in ships that were barely functional, thin aluminum shells crowded with fetid humanity, half of them corpses and the other half little more than corpses. The landings were hard, and many of the ships split open on impact, spilling bodies and precious air into the barely-more-than-vacuum of Mars. And still they fell, wave after wave of ships, the refuse of humanity tossed carelessly through space and falling onto the cratered deserts of Mars.

In the middle of the twenty-first century, the last of the governments on Earth abolished the death penalty, but they found that they had not yet abolished killing or rape or terrorism. Some criminals were deemed too vicious to rehabilitate. These were the broken ones, the ones too cunning and too violent to ever be returned to society. To the governments of Earth, shipping them to another world and letting them work out their own survival had been the perfect solution. And if they failed to survive, it would be their own fault, not the work of the magistrates and juries of Earth.

The contracts to build ships to convey prisoners went to the cheapest supplier. If prisoners had a hard time and didn't have quite as much food or water as had been specified, or if the life-support supplies weren't quite as high a quality as had been specified, what of it? And who would tell? The voyage was one-way; not even the ships would return to Earth. No need to make them any more durable than the minimum needed to keep them from ripping apart during the launch. And if some of the ships ripped open after launch, who would mourn the loss? Either way, the prisoners would never be returned to society.

G-g-grampa Jared, we are told, was in the fifth wave of exiles. Family tradition says Jared was a political dissident, sent in the prison ships for speaking too vigorously in defense of the helpless.

The governments of Earth, of course, claimed that political dissidents were never shipped to Mars. The incorrigible, the worst criminals, the ones so unrepentant that they could never be allowed back into human society: this was what the prisons of Earth sent to Mars, not political prisoners. But the govern-



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ments of Earth are long skilled at lying. There were murderers sent to Mars indeed, but among them were also those exiled only for daring to give voice to their dangerous thoughts.

Yet family tradition lies as well. There had been innocent men who were sent into exile, yes, but my great-great grandfather was not one of them. Time has blurred the edges, and no one now knows the details for sure. But he was one of the survivors, a skinny, ratlike man, tough as old string and cunning as a snake.

My g-g-grandma Kayla was one of the original inhabitants of Mars, one of the crew of the science base at Shalbatana, the international station that had been established on Mars long before anybody thought up the idea to dump criminals there. When the order came that the science station was to close and that they were to evacuate Mars, she chose to stay. Her science was more important, she told the politicians and people of Earth. She was studying the paleoclimate of Mars, trying to come to an understanding of how the planet had dried and cooled, and how cycles of warming and cooling had passed over the planet in long, slow waves. It was an understanding, she said, that was desperately needed on the home planet.

Great-great-grandma Kayla, in her day, had earned a small measure of fame for being one of the seventeen that had stayed on Mars with the base at Shalbatana. That fame might have helped some. Their radio broadcasts, as people fell out of the sky, nudged the governments of Earth to remember their promises. Exile to Mars was not—or at least they had claimed it was not—intended as a death sentence. The pleas of the refugees could easily be dismissed as exaggerations and lies, but Shalbatana had a radio, and their vivid and detailed reports of the refugees had some effect.

The first few years, supplies were sent from Earth, mostly from volunteer organizations: Baha'i relief groups, Amnesty International, the Holy Sisters of Saint Paul. It wasn't enough.

After the first two waves, the scientists who stayed behind realized that they would have no more hope of doing science. They greeted the prisoners as best they could, helped them in the deadly race against time to build habitats, to start growing the plants they would need to purify the air and survive.

Mars is a desert, a barren rock in space. There was no mercy in sending criminals to Mars instead of sending them to death. They could learn quickly, or die. Most of them died. A few learned: learned to electrolyze the deep-buried groundwater to generate oxygen, learned to refine the raw materials to make the tools to make the furnaces to reduce the alloys to make the machines to build the machines that would allow them to live. But as fast as they could build the machinery that might keep them alive, more waves of desperate, dying prisoners poured down from the sky; more angry, violent men who thought that they had nothing left to lose.

It was the sixth wave that wrecked the base. This was a stupid, self-destructive thing to do, but the men were vicious, resentful, and dying. A generation later, they called themselves political refugees, but there is little doubt that for the most part they were thugs and robbers and murderers. From the sixth wave came a leader, a man who called himself Dingo. On Earth, he had machine-gunned a hundred people in an apartment block that fell behind in paying him protection. On the ship, Dingo killed seven prisoners with his bare hands, simply to make the point that he was going to be the leader.

Leader he was. From fear or respect or pure anger, the prisoners on the ship followed him, and when they fell onto Mars, he harassed them, lectured them, beat them, and forged them into an angry army. They had been abandoned on Mars, Dingo told them, to die slowly.



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They could only survive if they matched the Earth's brutality with their own. He marched them five hundred kilometers across the barren sands to the Shalbatana habitat.

The habitat was taken before the inhabitants had even realized it was under attack. The scientists who hadn't abandoned the station were beaten with scraps of metal from the vandalized habitat, blindfolded, and held as hostages while the prisoners radioed the Earth with their demands. When the demands were unanswered, the men were stripped and thrown naked out onto the sands to die. In rage and desperation, the mob that had been the sixth wave ripped apart the base, the visible symbol of the civilization that had sent them a hundred million miles to die. The women who remained on the base were raped, and then the destroyers gave them the chance to plead for their lives.

The men of the fourth and fifth waves had joined together. For the most part, they were strangers to each other—many of them had never seen each others' faces except through the reflective visor of a suit. But they had slowly learned that the only way to survive was to cooperate. They learned to burrow under the sand, and when their homemade radios told them the base was being sacked, they crept across the desert, and silently watched and waited. When the destroyers abandoned the base after looting it of everything they thought was valuable, the fifth wave, hiding under the sands, burst out and caught them unprepared. Of the destroyers who had attacked Shalbatana base, not a single one survived. Dingo fled into the desert, and it was Jared Vargas, my great-great grandfather, who saw him, tracked him down, and killed him.

And then they went to Shalbatana base, to see whether anything could be salvaged.

G-g-grandpa found her in the wreckage and ripped the tape off her eyes. She looked at him, her eyes unable to focus in the sudden light, and thought him one of the same group that had raped her and sabotaged the habitat. She had no way of knowing that others from his group were frantically working to patch up one of the modules to hold air, while g-g-grandpa and others searched for survivors. As the leaking air shrieked in her ears, she looked up at him, blinking, blood running from her nose and ears and anus, and said, "You have to know before I die. Oxygen in the soil. Release it by baking."

"What?" g-g-grandpa said. It was not what he had expected to hear from a naked, bleeding woman who was about to pass out from anoxia.

"Oxygen!" she said, gasping for breath. "Oxygen! The greenhouses are dead. Some of the seedlings may have survived, but you don't have time. You need oxygen now. You'll have to find some way to heat the regolith. Make a solar furnace. You can get oxygen by heating the soil."

And then she passed out. G-g-grandpa dragged her like a sack of stones to the one patched habitat module, and shouted, "I found one! *¡Está viva!* I found one still alive!"

Over the following months, Jared held her when she cried and cursed, nursed her back to health, and stayed with her through her pregnancy. Theirs was one of the first marriages on Mars, for although some women had been criminals infamous enough to be sentenced to Mars, still the male prisoners outnumbered the females by ten to one.

Between them, the murderer and the scientist, they built a civilization.

And still the ships came from Earth, each one more poorly built than the last and delivering more corpses than living men. But that was in its way a blessing, for the men would mostly die, while the corpses, no matter how emaciated, had valuable organic content that could turn another square meter of dead Martian sand into greenhouse soil. Each corpse kept one survivor alive.



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Thousands died of starvation and asphyxiation. Thousands more were murdered so the air that they breathed could be used by another. The refugees learned. Led by my great-great-grandfather and grandmother, when a ship fell to Mars, they learned to rip it apart to its components before its parachutes had even settled. Of its transportees—well, if they couldn't breathe vacuum (and the thin Mars air was never more than dust-laden vacuum), they had better scramble.

Only the toughest survived. These were mostly the smallest and the most insignificant, the ones like rats, too vicious and too tenacious to kill. A quarter of a million prisoners were sent to Mars before the governments of Earth learned that behavior-modification chips were cheaper than sending prisoners to Mars, and tried their hardest to forget what had been done.

My great-great-grandfather Jared became the leader of the refugees. It was a brutal job, for they were brutal men, but he fought and bullied and connived to lead them.

There are no love stories on Mars; the refugees had no time, no resources for love. Love, to the refugees, was an unpredictable disease that strikes few people and must be eradicated. To the refugees, survival required obedience and ceaseless work. Love, which thrives on individuality and freedom, had no place on Mars.

Yes, Jared Vargas was a dissident sent from Earth for speaking against his government. But Jared Vargas died in the desert. When the men of the fifth wave came to the rescue of the Shalbatana habitat, Jared Vargas had chased Dingo into the desert, and that had been the last mistake of his life. Only one of them returned from the desert, wearing the suit of Jared Vargas, and calling himself by the name of Jared Vargas. No one recognized him, but the men of the fifth wave were from a dozen ships, and if any of them had been friends of the original Jared Vargas, they died after the new Jared Vargas returned from the desert. And the only men who would have recognized Dingo were the exiles of the sixth wave, and they were all dead.

He returned from the desert, and rescued my great-great-grandmother, and the men of the fifth wave accepted him.

But surely my great-great-grandmother was not fooled. She was an intelligent woman—brilliant, in her own field—and she must have realized that the man who claimed her for his wife was the same man who had led the army of angry rabble to rape her, rip apart her base, and laugh as they watched her friends die in the thin air of Mars.

But Mars required survival, not love. And Jared Vargas was the only leader they had.

There are many stories from the days of the first refugees on Mars. None of them are love stories.■

The greater the obstacle, the more glory in overcoming it.

—Molière

Do not look where you fell, but where you slipped.

—African proverb



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This isn't your average family reunion. . . .

# The Convergence of the Old Mind

## Larry Niven

Among the aliens who travel with the Chirpsithra are some who like it cold. Over the years, a succession of ice-blooded species have imposed their aesthetic views on the Siberian tundra that surrounds the Draco Tavern. What we can see through the glass wall includes winding paths and a vastness of wonderful statuary carved from ice. Some of the sculpture is alien storehouses and offices.

Through that barren, desolate, weird landscape I watched two ten-limbed spiders cloaked and hooded against the cold, picking their way through the winding paths.

Those would be Gray Mourners—Sfillirrath and one of her husbands. Sfillirrath, the larger, seemed in haste: she was taking short cuts through the sculpture, leaving her mate behind. She stopped by the biggest airlock and slowly folded herself and all those long legs into it.

The airlock revolved and she was in. Here and there, sensory clusters turned. Sfillirrath spoke a complicated phrase.

She hadn't spoken loudly, but she can't. My translator decided she'd shouted: "The Old Mind is gathering!"

Most of the tables in the Draco Tavern had privacy bubbles enabled. Most of the patrons heard nothing. But nine Bebebebeque, lined along the rim of the bar in front of me, tumbled off and streamed toward her.

Chittering questions, the six-inch-tall golden bugs followed her to a table full of Chirpsithra. She spoke, they spoke, all in the silence of a privacy bubble. Four tall and spindly Chirps got up, leaving one behind, and made for an airlock. The bugs stayed.

The Gray Mourner male reached the big airlock and folded himself through it.

Sfillirrath and her husbands had been hanging around Earth for two years now. *Chimes in Harmony* was newly


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arrived, currently hovering near the Moon. Sfillirrath had been aboard last night. What she carried would be the latest news, whatever it meant.

It seemed to mean a lot. Patrons watched her approach, listened, then . . . something changed. A few left. But—it took me a while to get it—nobody was talking to each other any more. In Sfillirrath's wake, they were talking to tiny or embedded communication devices.

I stayed at the bar as Sfillirrath circulated among the tables. This might not be any of my business. Then again, would I ever have come here if I weren't curious? I considered speaking to the sole remaining Chirp. As part of *Chimes'* crew she'd know—

But she too was talking to an entity not present.

Sfillirrath was talking to two Folk—and Gail was on her way to offer food or drink or service. Good girl. I'd ask Gail what she'd heard, later. Meanwhile Sfillirrath's mate had reached the bar.

He surrounded a stool, settled some of his mass on it, and spoke. My translator knew the Gray Mourner speech well. It said, "Hot liquid with much sugar and not much alcohol."

"Fruit flavor?"

"No."

I poured him hot tea with Benedictine in it. I asked, "Which are you?"

"You cannot perceive? I am Shkatht."

I said, "The Old Mind is gathering?"

"Yes, in the Orion Cluster."

"Who is the Old Mind and what does it gather?"

He stared, I think. Shkatht has too many eyes to tell. "Information," he said, "and intellect. Have you never heard reference to the Old Mind?"

"Never," I said.

He asked, "Have you ever wondered if there are entities older than Chirpsithra?"

I knew of very old entities that were supposed to be extinct. Otherwise— I asked, "How old are the Chirps?" He *might* know.

"A hundred million years, they tell us, or a half billion, or much less. There's some doubt about speciation. They hold all the red dwarves in the galaxy now, they say. Their first world has joined their first sun," Shkatht said. "But the Universe is older than that."

"I wouldn't think species last half a billion years."

"No, certainly not species—"

"Shkatht, what is your mate doing?"

"Spreading the word, offering opportunity to all. The Old Mind is converging near the Orion Birthground. *Chimes In Harmony* prepares to depart. Perhaps the Mind will talk."

Orion . . . birthground of stars? The Hubble telescope gave us pictures of fresh young stars and planetars in the Trapezium Cluster of Orion Nebula. I said, "You'll be centuries getting there. You make it sound like a grunion run."

"We will need more than centuries. A convergence doesn't happen all at once. Not many will choose to go. Some passengers will await the next ship. Some who planned to stay over will fight for a berth aboard *Chimes in Harmony*. They're all on their communicators negotiating, changing their plans. What is a grunion run?"

I said, "Fish come up onto shore to mate in the sand. We catch the grunion for food, if we can guess the right night."

Shkatht knotted himself in a laugh. "This is not a grunion run. We go in hope of speaking to the—oldest intelligence—no, not that. Most knowledgeable, it may be. Rick, permit me a question. What would you make of yourself if your options were infinite?"

I'd played such mind games in college. I said, "I'd make myself intelligent enough to decide what else I wanted."

More aliens were leaving.

"Rick, there will come a point for my kind, or for yours, or for any tool-using community that lives long enough, when intelligence may be made arbitrarily large. Can you see the danger in



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that?"

I said, "If you make a computer too powerful, it absorbs all knowledge and then turns itself off." I'd bought that knowledge the hard way, with my own money, when the Draco Tavern was new.

"Absorbs all available knowledge," the spider man corrected me. "If a computer can reach further, build its own instruments, telescopes, probes, it lasts longer."

"The poor fool who manufactured it still goes bankrupt!"

"Cease to think in terms of makers and owners, Rick. Let yourself be the computer, let you own yourself, let you seek greater intelligence. If you are confined to just one world, or just one solar system, there comes a point at which there is nothing left to think about. The information flow has fallen too far. You could never survive ten billion years."

"It's that old?"

"Guesswork."

"Go on."

"Give up speed of thought. Give up locality. Optimum might be a sluggish flow that sometimes clusters into blazes of brilliance."

I waited.

"We only know the Old Mind in its present state. What we find is a scattering of elements," Shkatht said, "everywhere in the starfield, spread across the Universe. These elements signal each other when their distance is less than . . . it varies greatly with intent . . . but let us say five light-minutes apart. Think of them as the cells of a brain."

"Tiny?"

"Elements the size of fine dust, a few million atoms each. They are adrift. They can guide their paths via magnetic fields or light pressure, sometimes up to very high speeds. The further they drift, the less is the intelligence of any grouping, do you see that? Their thought is slow, when every synapse spark takes up to five minutes, sometimes much more. But as elements spread away, their information gathering capability grows. A billion elements scattered through a light-year can become a wonderful telescope, or can engulf an object to study it exhaustively. The Old Mind learns, and from time to time, it converges."

What I saw with my mind's eye made a wondrous picture. I was getting excited. "So. A human brain is, what, ten to the twentieth nerve cells? Say you clustered ten to the *fortieth* elements of the Old Mind in that five-light-minute limit—"

"Too many. It would collapse into a proto-comet. We expect to see ten to the twenty-fifth or so before it all drifts apart, and the distance will be light-years."

"That's still a lot." A billion years of data cluster into a mind, and it thinks about what it's seen. "It kind of drifts into hyperintelligence, doesn't it?" It's done this before, and the memory is there. A mind forms and climbs toward evanescent godhood.

There would be an updating of the records of the Universe, a flurry of problem-solving, a flowering of new theory . . . vast slow thought. Spaceships passing through the cloud, or even inhabited worlds, might never be noticed, or might be studied atom by atom. After a time, the elements drift apart, seeking new input.

There would be no pretence that the Old Mind was a single intelligence, nothing like the illusion that a single mind occupies a human skull. Just mind forming and dissolving, carrying bits of what it's learned, eventually linking again in a different order, in a universe noticeably changed.

No death. Just the drift.

I asked, "Are you going?"

"Sfillirrath has not decided. I think we will go."

Many of the races I meet never expect to grow old. Others never expect to die. Still, "That's a lot of a lifetime," I said.


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"We want new races, new viewpoints, something to show an Old Mind. Else it will not converse and we will not learn."

"Uh-huh."

"We want a human being."

I looked around. Usually there are human customers. All I saw were Gail and Antony, my staff. "Kind of sparse today—"

"I have been asked to ask you, Rick Schumann."

My heart thudded hard. "I have this bar," I said.

"You have trainees. The Draco Tavern would continue," Shkatht said. "Rick, your kind has found only the most temporary of longevity techniques. If you were the only human being aboard *Chimes in Harmony*, ship's laboratories would be brought to bear to keep you alive and in good mental health. The Old Mind converges to observe the birthing of stars and free-floating planets and other wonders. We can seduce it with new viewpoints."

"You don't even know it'll *talk?*"

Shkatht shrugged, a disturbing sight. "A convergence must evolve the concepts of communication. Some remember from earlier ages. Some won't bother."

"I'll think about it," I said, and I poured him tea with a different liqueur. Shkatht extruded a snorkel from his tremendous mouth and drank.

He asked, "Are you disturbed by the company?"

"I like aliens. Even so, how many humans have you got room for?"

"How many must you have?"

"I'll think about it." Four, well chosen, might be enough to keep each other sane.

"You have little time to think. *Chimes in Harmony* prepares to depart. Passengers are gathering now. Entropy is having its way with you, Rick. Think how long you might live."

I said, "The Old Mind has immortality. It doesn't die. What it knows doesn't die. And if it ever—" I stopped.

Sfillirrath had emptied a bottle of maple syrup. Gail approached her with another. Sfillirrath spoke to her. She listened. Nodded.

Shkatht asked, "Why did you stop talking?"

"Shkatht, it never clusters *all* of itself, does it?"

"How could that be, since twelve billion years ago? But we think the Old Mind almost stopped manufacturing new elements, long ago, and we think we know why. It would have become the dominant natural force in the Universe. Nothing interesting could happen after that.

"We wonder if it was too powerful for a time. For billions of years following the Old Mind's expansion, we see no sign of other intelligence—"

"Rick," asked Gail, "may I speak to you?"

They took an established science fiction writer from Sri Lanka.

They took the manager of the San Diego Zoo.

They took Gail.

They wanted humans with a record for getting along with minds unlike their own. I hope three humans can keep each other sane.

I didn't go.

After all, I have this bar. All the traffic between Earth and the Universe passes through the Draco Tavern.

There have been other convergences of the Old Mind. Other Chirpsithra liners must have gone to visit them. Sooner or later the stories will come home to the Draco Tavern. All I have to do is wait. ■

*(EDITOR'S NOTE: Earlier tales of the Draco Tavern include "The Heights" [May 2001], "The Missing Mass" [December 2000], and "The Wisdom of Demons" [July/August 2000].)*



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# A Green Thumb

## Tobias S. Buckell

**When people must, they make do—and when the need lasts long enough, a way of making do can become a way of life.**

When Jerry walked out across his lawn to catch the morning bus to Effendale High, he stopped to admire the new car Mr. Atkinson had growing in his lawn. Jerry could see the doors stretching up towards the roof, small branches of metal trying to reach their stringy edges up and around the rough frame. It looked like a regular car had melted, but in reverse. Every day Jerry stepped out, he could see more of the car's gray paneling filling in around the frame. Mr. Atkinson tended towards planting larger luxury cars, like any other retired old man. The half-finished Cadillac sat in between the rose bushes and posies that Mrs. Atkinson cared for. Both car and bushes glinted with a fresh coating of morning dew.

Jerry looked at the Caddy and wiped his eyes with the back of his sleeve. There was no way in hell he would get on the bus with tears. Dad had flat out told him "no" before, and this morning's argument certainly didn't change his opinion.

Dammit, he was old enough to grow his own car. Maturity. Jerry bet he could do a better job than Mr. Atkinson.

The large yellow school-grown bus rolled around the corner, and Jerry hurried out to the sidewalk.

No matter. He had other plans.

Kids wandered through the halls and corridors, and Effendale echoed with adolescent energy. Jerry pushed through, finding his own particular group of familiars. Andy and Nathan looked up from an intense debate on cafeteria lunch. Hamburger, or hockey-puck. No one could present evidence on either side.

"Jer-ay! What's up?" Andy grinned. He did it perpetually. Sometimes it got annoying, but this morning Jerry found himself picking up a little.

"Nothing much."

"Watch out for Government," Nathan


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added. "Rumor has it Mrs. Newfield's going to lay down a pop quiz."

Andy looked at him wide-eyed.

"Shit. A quiz? I haven't studied. I gotta run." He abruptly weaved off to go and look for someone, anyone, with the appropriate notes.

Nathan waited for a second. Then, "Did you ask your dad?"

"He said no. Again. At this rate, I'll probably end up a senior on the bus." Nathan grimaced. Jerry waited expectantly.

"Well, I told you he would. I have it with me." As Jerry hoped. He looked at Nathan's worn-out denim bag.

"Really?"

"Really." Nathan reached into his bag. "It's not the greatest seed, but it should be all right if you play real close attention to the growing and prune the bad sections."

Jerry reached for the packet, but Nathan pulled it back.

"Money?" He asked. Jerry handed him a wad of bills. Almost everything he had in savings. Nathan handed it over, and Jerry flipped the small packet across his fingers. A small subcompact with a hatchback glittered on the decal.

"Wow," said someone from behind. Jerry froze. Allison. He felt tunnel vision fall into place, and the usual vague sense of panic. "Is that a car-seed?"

"Um . . ." Jerry began.

"Of course it is," Nathan said. "Jerry's stepping up." He put a proprietary arm on Jerry's shoulder. "He already has his temp. Once he grows this car, he'll be able to take people all sorts of cool places."

"Yeah," Jerry said. "I'm trying to grow a car."

And that was pretty much it for conversation. The three of them stood there for a minute looking for something to say.

"Well, I'm going to go study for the Government pop quiz. See you around." She bobbed off.

"She wants you," Nathan said.

"Dude, shut up," Jerry felt his face flush.

"Have you asked her to the dance?"

"Uh . . . no." Jerry played with the zipper on his bag.

"You should. Where are you growing the car?"

"Far enough away that Dad won't find it."

"Always a good idea," Nathan said.

Mrs. Newfield had a quiz. She was an old teacher, and she never stopped regaling them all with tales of her youth. She told them about spending twenty years as a riveter during the war, and about the cars she used to drive, made of metal.

Old adults always spoke about the war.

Jerry breezed through the quiz. What date did the war end on? June 8th, 1985. Write an essay on the cause of the war's end. Jerry thought about some. He remembered that the old dictator Hitler died of cancer in 1974, and that the war with Japan lasted longer.

Dad always tried explaining to him that people grew things because the war took all the metal for so many decades, that everyone left at home had to try and figure out other ways to get by.

Jerry just wanted a car.

Jerry planted the hatchback down near a pond half a mile from the house. He bought some fertilizer in a sack from a local car-farm, and made sure to carefully mix it in with the dirt and pack the seed in.

He figured he could come and water it when he found the time, but as the week progressed, he kept sneaking away. The car was his pride. He spent what money he had remaining on high-grade fertilizer; he even put out for extra topsoil to spread around the location.

Within the week, he could see the frame beginning to push its slender fingers out of the ground and take shape.



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By the second week, he was using his father's shears to trim back parts of the frame that kept trying to grow off in wild directions.

Keeping the car pruned wasn't easy. It took time, and careful cutting. He really had to strain hard to trim the stray pieces, because the car parts had their breed ancestry from the tree that produced ironwood. Ironwood, Jerry's dad said, came from the Caribbean, where it was once used to make propeller shafts and pulleys. During the war, it was used to replace cogs and axles. As the decades passed, it was no longer cut and shaped, but grown into all its uses as scientists looked for ways around the metal shortage.

Every other day after school, Jerry went down to the pond. Sometimes the pruning didn't quite fix it. Parts of the car just seemed . . . off to him. Like the hood. But anything could be fixed, or dealt with.

The damn paneling, though. It started to come in over the right wheel-well lumpy, and refused to cover it completely. But Jerry remained confident in his green thumb despite the small voice in the back of his head telling him things weren't quite working out as easily as he expected.

Saturday, on his way back from returning the shears to the toolshed, he ran into his dad. Dad looked at the bag, but didn't say anything. He followed Jerry into the house.

"You haven't been spending much time at home this week."

"I've been busy." Jerry realized that his dad was feeling guilty about not spending enough time with him. The price of long office hours.

"I hear there's a dance this Friday. You have a date yet?"

"Dad!" Jerry let the note of complaint drop. Take a hint, he thought, leave me alone. But Dad kept pushing it.

"Isn't there someone you're interested in asking out? Andy was telling me about someone the last time he was over here."

Jerry balled his hand into fist. He was going to kill Andy for letting that one slip.

"Yes. Allison." He flushed. Dad held the door open for him. They kicked their shoes off in the middle of the foyer.

"So have you asked her out?"

"No, Dad, I haven't."

"What are you waiting for?"

Jerry looked at his dad. He could almost look him eye to eye now.

"To talk to her, at school and stuff. I mean, she hardly even knows me. What if she says no?"

"You won't know until you call her," Dad said.

"Yeah, but what if she says no?"

"Sometimes you just have to bite the bullet."

Jerry shook his head. "Sure, Dad, whatever. Okay. Yeah." Like Dad was the expert on women.

"Watch your tone."

"I'm going upstairs," Jerry announced.

"Are the dishes done?"

Jerry shrugged.

Of course, Dad was waiting for him when he got back from school. Still skittish about Saturday's encounter, Jerry tried to get past the living room and head up the stairs.

He got stopped.

"Sit down."

The steely edge in Dad's voice meant business. Jerry sat on the couch and set a permanent scowl in place. His stomach flip-flopped when the shears came out. Dad set them on the small coffee table.

"What's wrong?" Jerry asked. But he knew. He'd been caught.

"I'm not totally unobservant, Jerry. I can put two and two together. I figured the best spot, and sure enough . . . you're growing a car down by the pond. I had it towed." Dad's green eyes flashed, and Jerry clenched a fist. He'd


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towed it? His car? "Just what the hell were you thinking?" Dad continued.

"Just what the hell was I thinking? I was thinking I need a goddamn car!"

"Watch your language."

"Fuck my language."

"Hey!" His dad slapped the coffee table for emphasis. "I won't stand for this. We've already argued it out. We agreed we were going to wait until you had your license. Until you'd driven, and definitely until you've wised up some."

"No, we never agreed. You told me." Jerry got up. Dad stepped in his way. "Get out of my way."

"Not until we get some things straight."

"I'm leaving now," Jerry said, notions of packing his bag and leaving entering his head.

"You're going to run away." His dad smiled. "Where are you going to stay? How are you going to eat? You spent all your money on that crappy rip-off some friend sold you."

That hurt.

"Well, it wouldn't be the first time you've had someone walk out on you, right, Dad?" Jerry regretted it the second he said it. His dad stepped back, shaken. They never talked about Mom.

Jerry hardly felt the slap. He staggered back into the coffee table, falling over. The glass broke and shattered across the tile, and Jerry felt the tears rolling down his cheeks. He ran out of the house, slamming the door behind him.

The plot by the side of the pond stood empty, the earth scarred by the wide tires of some sort of truck. A blackened, lumpy piece of paneling sat alone next to a thorn bush, a dragonfly laying a clutch of eggs into a notch.

Jerry sat by the pond until the tears stopped, and then he slept there. He snuck back into the house late at night, blinking owlishly.

His dad had cleaned all the glass up and done the dishes.

* * *

They played at avoiding each other for a few days. Dad went to work, Jerry went to school. Once home, Jerry would throw himself into homework, staying in his room, and Dad would lock himself in the study.

The only comment was made late in the evening, when they both showed up in the kitchen for a soda.

"Haven't you run away yet?" His dad asked.

Jerry ignored him.

It was hard to stay perpetually angry. Jerry forgot all about it when the phone rang, and then his dad poked a head in through the door with the portable.

"It's Andy. He sounds wound up."

"Thanks," Jerry said, taking the phone. They made eye contact, then Jerry looked away. "Andy?"

"Man, you are so gonna blow when you hear this!" Andy said.

"What?"

"Allison got asked out by some upperclassman."

The world got all woozy for Jerry again. Dammit. She'd smiled at him, liked him. True, he hadn't actually asked her out, but . . .

It was all so confusing.

He let Andy ramble on, then hung up and sat staring at the wall for a minute. This sucked. Everything sucked. The whole world sucked.

"You okay?"

Jerry jumped. He hadn't realized Dad was still there.

"Yeah, I guess," he lied.

"Want to talk?"

"Not really."

"Okay." His dad still stood there.

"I mean, if she kinda liked me . . ."

His dad stepped into the room.

"I hate to say 'I told you so,' but if you don't show initiative, you'll be going to most of your dances with Andy and Nathan."

Jerry mock-shuddered. "Now there's a thought."

His dad sat down on a spare chair,



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drawing it up.

"I've been thinking about the car."

"So have I," Jerry admitted. "I won't try again. I just wanted a car so bad. It would have impressed my friends . . ." He trailed off. He wanted to grow a car so bad it ached. But Dad was right; they couldn't afford to have a new car right now. Ever since Mom left, they'd been just squeaking by with money.

His dad cleared his throat.

"I changed my mind," he said.

Jerry's eyes widened, expecting Dad to hand him a seed packet with a gleaming new car on the front, but that didn't happen. Instead, Dad stood up and walked over to the window. "I won't buy you a new car. We'll use yours. I can at least teach you the mistakes not to make." Jerry followed him over and looked down.

On the lawn sat his car, lumpy sideboards and all.

"The sideboards are warped," his dad said. "The frame isn't quite up to crash standard, I can tell, but we can work on all that. I already ripped out the engine and transmission. It should take, though. It might be a few days until we see any progress. Our lawn is hardly prime area."

Jerry stood awkwardly next to his dad, then patted him on the back.

"Thanks, Dad."

Jerry stayed home from the dance. He and his dad sat on the front porch, two empty bags of fertilizer draped over the railing. Dad had come out with two beers, condensation running down the sides.

"A hard day's work demands a reward," he said. Jerry opened his, not liking the bitter taste at all, but sipping at intervals just like his dad, letting the beads of water run down the web between his thumb and forefinger.

They'd trimmed the dead parts of the car. The trunk and the hood needed to be retrained and regrown. The A-frame, though, was decent.

Not bad for a first car, son." His dad settled back into a deck chair. The ochre sunset gave the little hatchback on their lawn distended dark shadows. "Growing cars ain't easy. They take lots of work. You make mistakes, you prune them back, then you start over again and hope for the best. All you can really do is point the growth in the right direction and pray. And every year they release cars that grow faster and faster. Hell, when I was your age it took years to grow yourself a good car."

Jerry nodded, sipped at the beer and tried not to make a face.

"I'm sorry about . . ."

"Yeah," his dad said in a hurry. "I'm sorry, too. I shouldn't have hit you."

They dropped the subject and sipped some more beer, looking at the Sun dip behind the tree. Across the fence, Mr. Atkinson stood up from pruning, placing one hand on the hood to steady himself, waving with the other.

Jerry and his father waved back. ■

Hope deceives more men than cunning does.

—Luc de Clapiers,
marquis de Vauvenargues



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Probability Zero

# ZERO TOLERANCE

## Kevin Levites

Little Tommy felt the delicious thrill of danger that came from profound disobedience as he snuck his weapon past the heavily armed guards. Tommy was a bright student, and he knew enough to make sure that the weapon detectors didn't betray his treasure, and that the dogs—with their cybernetically enhanced noses—smelled nothing suspicious.

There were, of course, infrared cameras within the classroom, but Tommy knew that his finger paints would effectively disable the video once they were smeared on the lenses.

The magic moment came, and Tommy deployed the weapon against his hated enemy, Sally . . . the girl that he had loved since the first grade, more than a year ago, until she had spurned him.

There was an immense sense of satisfaction as the weapon hit its mark, and Tommy reveled in victory until Security arrived moments later to take him into custody for violating the Zero Tolerance Policy.

* * *

He was tried as an adult, and had plenty of time to reflect upon his future as he picked up dead animals on the side of the road while working on the chain gang. He often compared the fateful rubber band to the rubber band that that held Sally's hair in a ponytail, and he thought that his rubber band was nicer and would have made her hair look much prettier. ■


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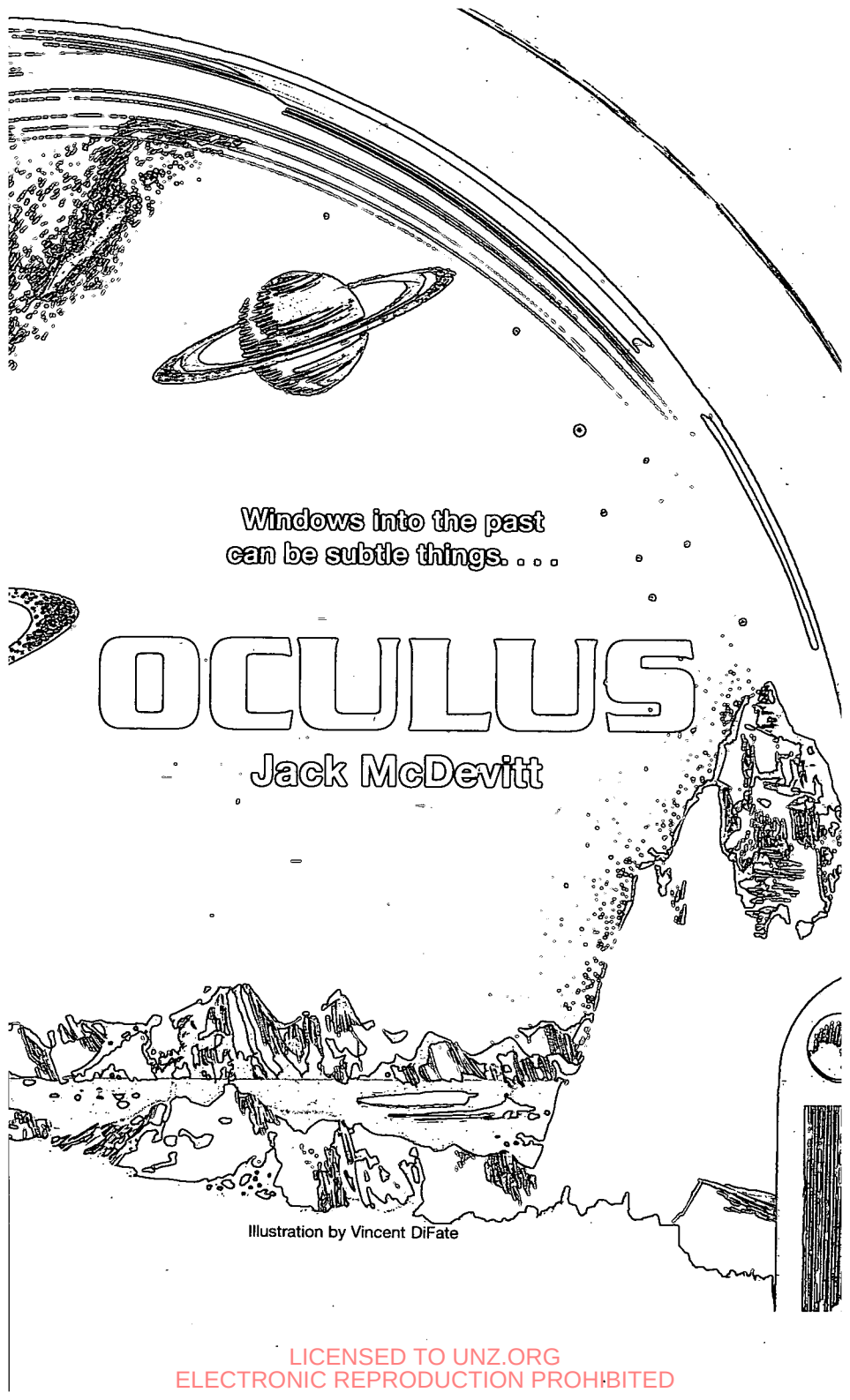

Windows into the past
can be subtle things. . . .

# OCULUS

Jack McDevitt

Illustration by Vincent DiFate

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The cockpit was illuminated by the instrument panel, and by the soft glow from Autumn's rings. As we climbed toward orbit, George Blasingame sat quietly in the right-hand seat, utterly absorbed by the reality of what we were carrying. The ultimate cargo. "You know, Kellie," he said at last, "we already have the critical information about them. Even if we didn't have the books, we have the *window*." I knew he was talking about the *oculus*, the big circular window in the main room of the long-dead alien base below. From its mountaintop perch it looked out over the craggy moonscape, and provided a matchless view of the spectacle in the skies. But I had no idea what he meant.

He was, I think, about to explain when the lights went off. *Everything* went off. Whatever it was, I never saw it coming. It ripped through the electronics, killed the AI, took out the thrusters and the spike, shut down life support, blew communications, and knocked out almost every onboard system we had. *Delta* slowed and staggered. And began to fall.

"What the hell was *that?*" George gripped the arms of his chair and looked wildly around at me.

We were twenty-some klicks above the surface.

"Kellie—" he howled, his expression suggesting that *I* was responsible.

"We'll be fine," I told him smoothly while I tried to get my systems back on line.

"The cargo," he reminded me. Yes. Don't lose the cargo. Whatever else happens.

We had four-hundred-and-some-odd books stashed in *Delta*'s storage, frozen in packs after centuries of being exposed to the void. Property of whoever had owned and lived on this moon. That was a long time ago, maybe when Charlemagne was running things. We'd brought them out of the house and placed them carefully in specially prepared containers. When we got them up to-orbit—a scenario that was beginning to look problematical—George was going to thaw them out, scan them, and produce copies. The copies would eventually, it was hoped, be translated. He was going to scan them because George doubted we'd ever be able to get the pages apart without damaging the individual volumes. But he'd removed a navigational scanner from the hull of the *Bromfield* and adapted it for ultra-short-range work. He was especially proud of that bit of jury-rigging. I doubted it would work. Navigational scanners just don't lend themselves to the kind of close-in effort he was talking about. But what did I know?

The books constituted, the authorities were saying, the most valuable payload that had ever been moved from one place to another. For the first time, we were going to get an insight into how other minds *think*. Who knew what the books might contain? The academy director herself had overseen the operation, had taken a moment to remind me what I was carrying. *All you have to do, Kellie, is get them to the* Bromfield. She was Columbus discovering the new world. Carlyle landing on Mars. *Don't fly into a mountain*, she'd added.

Ha ha ha.

"Kellie, *do* something!" demanded George.

When the spike fails, the best thing, according to the manual, is to give it some time. That becomes a problem when you're in free-fall. Status lamps started to blink on. Backups were trying to activate. The fans squealed and a cool draft whispered out of the air ducts. The thrusters came to life and gave us a kick. I rotated them down so they could slow the descent.

That helped. But it was still a back-breaker and George's eyes got big and round.

We hadn't lost hull integrity. But the spike showed zero lift. The thrusters would never be enough to keep us from


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getting smeared across the landscape. And anyhow, I'd exhaust the fuel if I had to keep burning it at its current rate. We needed the spike. I tried to reactivate it. The needles quivered, settled back to nil. I tried again. "We might have a problem," I said.

Let me dispel any preconceptions at this point by mentioning that I'd known George Blasingame almost five years. He was no coward. I've seen him face down bureaucratic bullies, and I watched him go into a temple on Quraqua during a major earthquake to salvage a couple of pots. So when he started looking terrified I knew what the problem was.

"The books," he said.

"I'm doing everything I can, George."

"I don't believe it," he growled. "I've been riding these damned things for twenty years. And today of all days—" He said it as if having any of the earlier landers go down with him in it would have been a small matter.

I told him to turn on his e-suit and handed over his air tanks. I activated my own, depressurized the cabin, and shut down everything except the thrusters and the controls. Then I tried the spike again. The needles jumped, took hold, and climbed a bit. Some of our weight drained away. I got it up to about 30 percent. Not good. Not nearly enough. But it would buy time.

I used the thrusters to gain some velocity and settled into a long elliptical orbit which wasn't going to hold, but might get us around the moon twice before we hit a mountain.

I kept trying to raise the *Bromfield* while George urged me on. "Tell them we need help," he said, as though I hadn't noticed we had a problem. After a couple of minutes, we got a burst of static. And then Jimmy Amir's voice. Jimmy was one of the technicians on the *Bromfield*. *"—you okay?"* he said. *"Kellie, please answer up."*

"I hear you, Jimmy. We've got an emergency here." I tried to sound as if I were reporting a plumbing problem. "Spike's at 30 percent." We weren't going to do any more serious climbing, but we were almost maintaining altitude.

The signal faded, and then came back: *"—orbit?"*

"Negative," I said.

George knew exactly what that meant and he did a desperate look toward the cargo door at the rear of the cabin. "Can we go back down?" he suggested. "Back to the Retreat?" That was the name we'd given the house on the mountain.

"We can't. We wouldn't make it."

"Kellie, this thing has spike technology. We can just float down."

I had to hand it to him. Most people would have been yelping about maybe getting killed, but he wasn't even thinking about himself. "We don't have enough lift," I told him.

"Then we have to salvage the cargo," he continued. "That has to be our first priority." And then, in case I wasn't getting the point: "It doesn't matter what happens to us."

Speak for yourself, Champ. Anyhow, none of it mattered. All the priorities were going down. He saw it in my eyes. "I'm sorry, George."

Jimmy was reading my status reps. *"Not good, Kellie."*

"Looks like."

*"Okay. Tod's on his way. Figure about fifty minutes. Can you stay up that long?"*

"Yes." Firm. Voice steady. Hand on the stick. All for the good of the passenger. In fact it would be touch and go. "Jimmy?"

*"Yes, Kellie."*

"What was it?"

*"An EMP."* An electromagnetic pulse.

"But we're shielded."

*"Double dose. Both Twins let go at once."* The Twins were the pair of gas giants in the neighborhood. They pumped out EMPs on a fairly regular basis. But what were the odds against simultaneous blasts?

George was shaking his head. "What's



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going to happen when he gets here? Can he repair us?"

"Not underway. You and I are going to transfer over to *Alpha*." Tod's lander.

He looked as if I'd hit him with a stick. For a moment he said nothing. And then: "What about the cargo?"

I met his eyes and shook my head. The patient's not going to make it, George.

"We can't just abandon it," he said.

I don't get irritated easily, but I wondered what he expected me to do. "George," I told him, "I hate to put it to you this way, but the cargo's the reason we're going down." The simple truth was we were hauling too much mass. Without the books, we might still have made it into orbit. If I'd been able to do it, I'd have jettisoned every last one of them.

And okay, I know what you're thinking. But my first obligation is to the ship. And my passenger's life. Not to mention my own.

In case anybody out there was in Tibet for the last year, the moon's name was Vertical. They called it that because it moves around the Twins in a perpendicular orbit.

The two gas giants in the system are pretty much identical in mass and size, and both have rings. They're close together—only about three million klicks—and they're caught in a gravitational dance. If you watch them from the Retreat, you can see them rise every twenty-some hours, circle each other, and set. It's a hell of a show. I understand, when they reconstruct the place in Arlington, they'll be able to recreate the effect in the oculus.

Their equatorial diameters measure 65,000 and 63,000 kilometers. Cobalt is the smaller of the two, and the brighter. It's a jewel of a world, with silver and blue and gold belts. The blue is the result of methane slurry and ice crystals on the outer shell of the atmosphere. Cyclonic storms float deeper down, swirls of yellow and red with golden eyes. It's gorgeous.

The companion world, Autumn, is darker. It also has a collection of storms, which appear to be larger and less well defined. Naturally they named the system Gemini.

At the center of mass, between the Twins, there's a cloud larger than either. It's dark and heavy, lit with internal fires, a cosmic thunderstorm marking the point around which everything else—planets, rings, and moons—orbits. It looks like a planet, creating the illusion of three worlds in a line.

And to complete the symmetry, there's a third ring, circling the entire system. It's enormous, less well-defined than the individual planetary rings, a shining highway that, seen from our position near Vertical, passed into infinity in one direction and dipped below the horizon in the other. Earlier, George had laughed while he admitted he couldn't begin to pin down the local directions. Who knew which way was east when the sun was lost amid all the moving lights and shadows?

Vertical's orbit was extremely unstable, and the experts said the chances of its having happened naturally were remote. Almost nonexistent. Most of them thought that within a few thousand years it would lose its unique position, which lifts it away from everything else and provides it with extraordinary views of the Twins.

The Retreat was perched on a ledge near the top of a mountain in some of the roughest terrain I've ever seen. It's got drapes and carpets, all pretty much washed out. And beds and chairs and sofas. All the furniture's too big by half for humans. And there's something else about it, something dark and gloomy in the design that tells you right away it wasn't designed for us. It gave me the chills, for reasons I couldn't explain. Brownstein, who specializes in these sorts of things, says that the symmetries are slightly off, and that the equivalen-


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cies don't quite match up. I don't understand yet what he means, but he says it's visceral. And it is.

The place looks almost like a Victorian mansion. Lots of windows, a tower at one end, a courtyard. It was perched on a shelf high up one of the taller needle peaks. And it had apparently been abandoned for over a thousand years. We had the remains of its two occupants. They were humanoid, but definitely not human. Not someone you'd have invited over for dinner.

Tall, with gray flesh, dark eyes, fangs, long narrow hands that ended in claws. We even had a portrait of one of them. It was from the tower room, and the thing was wearing a robe and looking every bit like the grim reaper.

At the time, they were just beginning to take the Retreat down. The plan was to move it to Arlington and put it back up along the shore of the Potomac. George had had a big argument about that with Sylvia. He thought the Retreat should be left where it was. He'd grumbled constantly over the last few days. It was sacrilege, he thought. I think it was the convenience store that really got him. "T-shirts and monogrammed whiskey glasses. Is there anything we won't do for money?"

I'm not sure how he thought the academy got its funds, or whether he'd have been upset if they'd held up a couple of his paychecks because no cash was available. I myself saw no problem with it, but the idea sure had him lit up.

After twelve minutes or so of strained silence, we reached apogee and looped around the other side and back toward the surface. Somewhere in the middle of all this, my sensors came to life and it became a little easier to judge our flight parameters. But it was tricky because the ground ahead kept rising and I never knew where perigee was. We were gliding down and we were getting desperately close to the ground.

"Mountains," said George, who must have thought I was blind.

He'd been quiet for several minutes while we moved across a wide corrugated plain. I'd been watching the peaks grow and kicking the thrusters to get more altitude. Fuel by then was pretty low. "We'll get over them," I told him.

"Kellie," he said, "we're so close to the ground. Why not try to land?"

If we'd had a set of wheels and a runway it might have been possible. "We'd hit too hard," I explained. "There'd be no chance."

"You're talking about *us*. What would happen to the cargo?"

"Everything back there is frozen, George. Brittle. It would shatter."

I could see his mind working, trying to come up with something to save the payload. I wished he would give it up. "What happens after the other lander takes us off?"

"We go back to the *Bromfield*."

"I mean—" He nodded at the cargo door.

"It'll go down."

"Can we set it to *try* for a soft landing?" It was a cry for help and I felt sorry for him, sorry I'd come aboard, sorry I had anything to do with this.

"If we could get Bill up and running, yes, we could make the effort." Bill was the AI. "But he doesn't respond. I've been trying."

"Try again, Kellie."

I did. Bill wasn't even a blip.

"There must be *something* we can do," George said.

The Retreat had at one time been protected by a Flickinger field, or something very much like it. But when it failed, the individual volumes had frozen. After the initial attempts, no one had tried to open them. Or even to remove them from their shelves.

George was the expert. He'd come with some heat lamps, had used them to break the books free so they could be loaded and taken to orbit, where a team of specialists waited anxiously to begin


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probing their secrets. He was a little guy, thick brown hair, bushy mustache, a bit overweight. Not the sort of person you'd meet and remember. He had a wife somewhere but he never talked about her. I suspected she'd broken his heart. Don't know why I thought that, he never said anything that I can recall. Still, there it was.

He'd been positively glowing while he separated the volumes and we began storing them into shipping containers and stacking the containers in *Delta's* cargo hold. "Here," he'd said, rapping on the cargo hatch after we'd sealed it, "with a little luck, we should have their heart and soul. For the first time, Kellie, we'll see what the Universe looks like through someone else's eyes."

We cleared the mountains, close enough that I could have put a foot out and dragged it across a couple of the peaks. Somewhere in there we must have hit perigee—I really had no way to know exactly where. But Tod told me we were gaining ground, that we'd be okay now.

I looked back for him. Our telescopes weren't working, but it wasn't hard to find *Alpha*, which kept getting brighter, and had gotten close enough that I could almost make out its shape.

*"How you holding out?"* he asked.

"Okay. We're packed and ready." I tried not to sound too relieved. "What's your TOA?"

*"Twenty-one oh-seven."* Eleven minutes. *"I'm going to let you make your turn, and then I'll pick you up on your way back in."*

Sylvia broke in from the Retreat: *"Kellie, I'm sorry to hear you had a problem."*

"We're going to lose the cargo."

*"I know."* She sounded sympathetic. *"Your priority is to save yourself and George."* She paused, apparently uncertain what to say next. *"Can he hear me?"*

"I hear you, Sylvia."

*"George, I'm sorry."*

"Incredible piece of luck."

*"Nothing to be done."*

"Syl, I'd give my life—"

*"Not today, George. I'll see you topside for a late dinner."*

"Yeah," he said.

*"It's okay. We'll salvage what we can."* Then back to me: *"Kellie, take care of him."*

"We'll be okay, Sylvia. Tod's on the scene."

"All right. Let me know when you're safe."

She signed off and a few minutes later we rounded apogee and began sinking again. We were coming in lower this time, only a few thousand meters above a range of escarpments and ridges. *Alpha* drew alongside. "Time to go, George," I said.

He nodded and slipped silently out of his restraints.

I wouldn't have you think I was unsympathetic, but I was delighted to be getting out alive. I thought he could have been a bit more grateful. "George," I said, "for all you know, they're nothing more than a collection of thrillers. Or sociology texts. Or—" The way he looked at me shut me down. "I'm sorry," I said. "I wish we could save them."

"You said we can't ride it down. But we've gotten pretty low. Why not *try?* We aren't going down that fast." Beyond the crags the ground was leveling out.

"It only *looks* that way," I said.

*Alpha* was gray and boxy, with its windows lit up. We were on the side away from the Twins and the cloud, but parts of the big ring were always in the sky, casting an ethereal glow over the landscape.

*"You ready to go, Kellie?"* Tod was a big, freckle-faced kid just out of school. Flirted with everybody and thought the world would open up to him any time he wanted it to. He also had the happy trait of inspiring confidence. I knew he'd do whatever was necessary to get


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us out.

"On our way."

I activated the airlock but it didn't open.

"What's wrong?" asked George.

"No problem. But I need your help."

"Sure. What can I do?"

I released my harness and, keeping my hands on the controls, slipped carefully out of my seat. The spike was staving off free fall, but that was about all you could say for it. It was like being in a damaged parachute.

The last of the mountain range blurred past.

"Take my chair."

He wriggled into it and I showed him what I needed. "Keep this down. The stick stays here. If this light turns yellow, call me."

He nodded and said okay. I hustled over to the airlock, opened the inner door manually, and then the outer hatch. Tod closed to within a few meters, opened up, and appeared in the airlock.

*"Good to see you, Kellie,"* he said. His e-suit glimmered in the light from the ring. He held a lanyard.

*"Ready?"*

"Go ahead."

Looking back now, I have the impression I was vaguely aware of movement behind me. Maybe not. I can't be sure. But I caught the lanyard on the first toss. It was a pair of cables, actually. I separated them, clipped them to my belt, and then turned around. My intention was to attach one of them to George, reclaim my chair until he'd jumped to safety, and then follow him out the door. No problem.

But the inner airlock hatch was shut.

At first I thought there'd been a systems failure and the electronics had closed it. Then I realized what had happened. "George, what are you doing?"

"Get clear, Kellie. I'm going to do what I can for the books."

"That's crazy."

The ground was coming up fast.

I pulled the handle out of the housing and tried to open the door, but the handle wouldn't turn. The son of a bitch was holding the hatch shut.

"George, let go."

"Kellie, *please*. The longer you stand there, the worse my chances."

"You're not even a pilot."

"I've been riding these things all my life. You think I don't know how they work? It isn't rocket science, Kellie." He laughed, but the sound bordered on hysteria. "Please go."

*"Kellie,"* said Tod, *"what's going on?"*

"Damn you, George. Listen, open up and I'll stay." Like hell. I'd pop him one and drag him out.

"No," he said. "No reason for that. Go."

I could have argued. But there was no time and I wasn't going to throw my life away because somebody else didn't know when to toss in his cards.

*"Kellie, it's getting late out here."*

Idiot.

I called his name one last time, listened to my heartbeat. And jumped.

My weight soared momentarily as I cleared the dampers, and then all but vanished as I came under the influence of *Alpha*'s systems. It was the only time I'd done that, passed from one antigrav field to another, and it was a little like getting punched simultaneously front and rear. Tod hauled me in and we stood looking helplessly at the open airlock.

"Not your fault, Kellie," Tod said. "There wasn't anything you could do."

*"Tod."* It was Bill, the AI. This version spoke with a Brooklyn accent. *"If you and Kellie will shut the hatch and bang on, we can at least level off."*

Tod closed up and started to pressurize. Meanwhile, we both grabbed a rail and he signaled Bill. The deck rose.

"George," I said. "Can you hear me?"

*"I hear you, Kellie."*

There didn't seem much point in recriminations. "Are you back in the



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chair?"

*"Yes."*

"Restraints?"

*"—are already on. And the air's back on."*

"Point the thrusters *down*."

Pause. *"How do I* do *that?"*

Yeah. You know how to operate it. "Red levers on your left. On the stick. Push full forward."

I heard him grumbling to himself. Then: *"Done."*

"Now turn on the thrusters. Full. You know how to do *that?"*

*"Explain it to me, please."*

While I told him how, the inner airlock door opened and we took our seats. Tod watched him going down and shook his head.

The thrusters came on and his descent slowed. But it wasn't going to be enough, and even had it been, he was moving forward too quickly. The ground, which had looked relatively smooth from a couple of thousand meters, became a hopeless tangle of rock.

*"Kellie."*

"I'm here, George."

*"I'm sorry. I know this will create a problem for you."*

"Forget it. Just hang on."

*"Okay."*

And pray.

Tod had set up a clock. I saw thirty-six seconds begin to tick down.

"And breathe off the tanks." Normally, in a standard environment, the suits use a converter.

*"I can't. I took them off because they're not comfortable while I'm in the seat."*

"Reconnect them. On your left, beside the seat, there's a rack. Put the tanks in there. But keep them connected."

I could hear him struggling with them, trying to figure out how to do it. Then he told me it was okay. *"Looks too fast, Kellie. I don't think it'll matter much."*

I didn't say anything. Didn't know what to say. He's watching the ground rush up at him, what am I going to do, tell him everything's going to be fine, have a nice day?

The last few seconds ticked away. And without a sound *Delta* ripped into the landscape. There was a brief flare in the darkness —not enough fuel left for a real explosion—and he was gone.

They didn't exactly blame it on me, although the muscles in Sylvia's jaw did funny things when she saw me again, that night and during the investigation and later at the memorial service. We all said nice things about George, how he always found time for others, how he loved his work, how he was extraordinarily patient. None of it was true, of course. I mean, he didn't really *love* his work, for example. Most of the time it was fairly routine and he *endured* it. Now and then it turned up something that really engaged his interest, like the books in the Retreat. But that wasn't the same thing at all.

He *did* succeed in saving most of them. So he became the hero of the hour, and we all drank to him. A few people looked down their noses at me, visibly grateful that *someone* had had the guts to stay with the payload.

In the end, though, it didn't matter, at least as far as translations were concerned. The print—the ink—was smeared beyond recovery. Nobody's sure yet whether it was that the force field that guarded the Retreat had stayed on for a longer time than we'd first thought, blocking out the preserving vacuum, or whether the occupants of the Retreat had needed a moist environment. Whichever it was, there'd been too much humidity over an extended period. The specialists had enough to conclude that they could detect only one language, that the language used upper and lower case, that it read from right to left, that it used punctuation, and that individual words were separat-



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ed by spaces.

And that was it. Whatever scientific or philosophical ruminations might have existed therein, whatever timeless novels, whatever observations on the state of the Universe, it was all lost.

So when I ventured to suggest to Sylvia that George's sacrifice had consequently been pointless, she drew herself up in righteous indignation. We were standing in the main room, in front of the oculus window, looking out at the spectacle of worlds and rings. The sofa and one of the armchairs remained, huge pieces of furniture, the way everything looked when you were four years old. One of the side walls was in the process of being taken down and prepared for shipment back to Arlington. "Don't even think it," she said. "The books are invaluable artifacts, even if we can't read them."

Well, I guess she was right. But that didn't seem like much consolation for what we'd lost. And I couldn't help recalling George's comment just before it all started. *"We already have the critical information about them. Even if we didn't have the books, we have the window."*

What critical information?

I related the remark to Sylvia.

She frowned, considered it, and nodded. "Well," she said, "I guess it's a reference to their esthetic sense. I suppose that's significant. Considering what they looked like,"—she managed a smile—"that comes as something of a surprise." She turned away to caution one of the technicians to use more care in lifting a section of wall.

I thought there must have been more to it. But it didn't occur to me until later that, if you stood in front of the oculus at the right angle, you could see your own reflection.■

We must always change, renew, rejuvenate ourselves; otherwise we harden.

—Johann Wolfgang von Goethe

Our life is frittered away by detail...Simplify, simplify!

—Henry David Thoreau



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# Spoilers

## Shane Tourtellotte

**Memory can play tricks on people—and vice versa.**

"Every movie theater in America will have a memory blocker in three years. That is, every one that stays open."

Al Yost narrowed his gaze on the visitor in his office. Mr. Roderick was young, tall, blond, and handsome, perfect preformed Hollywood product. His glow made Al feel his own imperfections keenly: exactly what a salesman promising to fulfill his needs would want.

"You and your people are making a lot of assumptions, Mr. Roderick," Al said.

"Please, call me Jim."

*Not while you're smiling that way.* "Why would people want to forget about a movie before seeing it?"

"Because most people have learned too much about that movie before they sit in one of your seats. The publicity machines see to that. May I?"

Roderick was reaching toward the binder labeled *Caledon Bijou—Future Releases* by the computer. Al nodded, regretting for once that he hadn't moved his records to handhelds.

"Look at the summer releases, Al. I bet you could already recite the full plots to most of the big movies." He leafed through the pages. "*Infinite Reflection*, sure; *The Last Time; Strike Force 2;* oh, *Animals!*—and who doesn't know all about *Episode VII* already?"

"You're asking the wrong person," Al said, taking the binder from Roderick's hands. "I'm owner and manager. I'm just staying on top of my business."

"That's the trouble. Everybody's on top of movies these days. The studios chase customers with preview spots on TV, 'Making Of' documentaries, promo websites. What the producers and studios don't give away, Internet snoops dig up, like it or not."

Al shrugged. "People can always steer clear of those sites, and the TV programs."

Roderick shook his head. "We're an information society. People use those previews to decide what to see. That's why they're made. But it takes away spontaneity, freshness. By the time people come here, their appetites are half-sated by watching the best clips in commercials or *All Hollywood* or downloaded cut-scenes. Some people see so much, they don't bother with the movies."

"They could trim back the previews..." Before Al could finish his thought, his eyes fastened on the framed *King Kong*


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poster behind Roderick. In its day, that was close to cutting-edge publicity. ". . . but you'd lose customers to the more aggressive entertainment outlets," he finished pensively.

Roderick beamed. "Exactly! We can't escape that race, but we can escape its bad effects on the audience, with the memory blocker." He stood up, making expansive gestures. "The publicity campaign draws them here, but before they go into the theater, our machine suppresses their foreknowledge of the movie. They make the informed decision to watch, but get to see it fresh and new.

"Theaters have improved service before to hold audiences: wide screens, sound systems, digital projection. This is the same principle, but bigger than those incremental changes. This is the innovation movies need to reverse their loss of audience."

He stood, grinning, waiting for Al's reply. Al pushed his chair out slowly. "Okay, Jim, I'm listening." He kept his voice cool and skeptical.

Roderick went into the theater proper, pointing out the best places for installation. He recited size and capacity figures, installation requirements, and safety features. He had the perfect sales patter. Had he been a little less polished, Al would have been a little more convinced.

"I am going to give this serious thought," he said once Roderick wound down. "It is a sizable investment."

"And an excellent one. You can have everything in place before the summer season starts."

Al glanced through the glass of the doors, at the snow still falling outside. "Depends on when you count it starting, Jim. I can remember when it actually began in the summer."

Roderick laughed. "Imagine that. Sure is before my time." He dismissed the abrupt stiffening of Al's smile. "Fair warning, though, Al. I've already visited the West Meadow Cinema, and the Elmford Odeon 8. I got very positive receptions there, and I'm due at the Barton Cineplex in less than an hour. You might not want to be the last on board, especially if there's a production bottleneck."

"I understand." He shook Roderick's hand, keeping up a friendly smile. He would definitely be doing some research tonight.

Al spent an hour online at home after the Bijou closed that night. He found several sites describing induced neural inhibition, and gleaned enough to know that the process was not fakery or hypnosis, but a real effect inside the brain. Beyond that, the jargon set his head throbbing.

He slipped into bed, not disturbing Elaine, and set his alarm an hour early. He needed extra time in the morning to make calls, to find out whether this was actually safe.

He contacted both his family physician and the neurologist he had seen for tests three years back, when he had those dizzy spells. His regular doctor said yes, neuroscience had reached that level of sophistication, and it could work, and be safe. The neurologist said much the same thing, in more words.

Al wanted to pursue the issue, but it was Saturday, and Saturdays meant matinees. He went in to work, a full half-hour before any of his employees arrived, two hours before first showtime. It gave him time for more thinking.

He caught the second showing of *Winds in the Valley*, the Oscar contender finally rolling into wide release. He did that with most new movies, less for himself than to catch audience reactions as they watched, to assess the word-of-mouth that would help determine how long a film would draw paying customers. This one looked to have staying power, even if it would be staying at a moderate level.

How much would these people reveal to their family and friends, to in-



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duce them to come here? It did seem a pity to pick out threads of such a tight plot, before someone got to see it as a whole. Such dissections were better left for film classes in ten or twenty years.

Of course: his old film professors. He could imagine them sniffing at the modern media saturation impinging on the purity of films. It was time to ask them what they thought.

It occurred to Al that if he was seeking out advice, confident of what it would be, he had to be leaning that way already. Well, maybe he would be surprised.

He was, in the wrong way. Of the four cinema professors he remembered having at Clairmont University, two had died, and a third was retired and seriously ill. Thirty years hadn't seemed that long to Al, at first.

With his free Sunday morning time dwindling, he reluctantly put through a call to Armand Dunphy, the last man on his list. That barking voice had taken on a croak with the years, but it sent shivers of recognition through Al. He reintroduced himself to Dunphy, and encapsulated the memory-blocking technique. Dunphy began scoffing before Al had finished.

"Idiotic. Movies are not about surprises. To any attentive viewer, there can be no surprises in movies. They are all products of external context, the contemporary culture as filtered through directors, writers, actors, anyone with a creative drive. If you know your times, and know the people making the film, you will know that film before watching a frame.

"What moviegoers don't realize—and what you, Yost, apparently have forgotten—is that the real interest in a movie derives from the interactions of creative drives that go into making it. The actual celluloid or digital file is usually a pale silhouette of those collisions. Repressing foreknowledge is pernicious, Yost. Don't do it." Dunphy cleared his throat. "I hope I've helped you."

Al leaned back in his chair, wrung out. Now he remembered why he had switched his major to business administration, and only minored in film. This soul-sucking pedant had almost killed his love of movies in college.

"Yes, Professor Dunphy, you have definitely helped make up my mind. Thank you, and good-bye."

Roderick was unavailable the first time Al called him from his office. As time and work intervened, his backlash against Dunphy cooled. The man was a prisoner of his own theories—but so far, all Al had about the memory blocker was a sales pitch and his own musings, just different kinds of theories.

In theory, with its actors, director, and effects, the remake of *Tron* should have been last year's biggest hit. The audiences—small ones—had proved differently.

Al waited for the lull when all the movies were in their first showing, and headed back to his office. This time, he got Roderick.

"I'm almost convinced," he told the salesman, "but I need a demonstration. I'm willing to pay for a week's trial run—"

"Sorry, Al. We aren't set up yet for theaters and current releases. Besides, I'd be giving one theater an unfair advantage."

"I don't mean at the Bijou. I mean at my house."

Al swore he could hear Roderick grinning over the phone line. "That's what I hoped you meant."

The work crew muscled the apparatus down the basement stairs, and through the doorway of Al's personal theater. A widescreen console dominated one long wall, with a sofa, chairs, speakers, and disk-shelves consuming most remaining wall space. Al made room in one corner, leaving just enough


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space to squeeze through the doorway.

He looked over the machine, nearly as tall as he was, with a dark, glossy plastic housing. He gingerly picked up the metallic net on its roof, keeping the wires from tangling. It looked fragile for something so powerful.

"That's the miracle worker," Roderick said, taking it from Al. He loosened the tie of his perfectly tailored suit. "The mesh goes over the head, the green disk in front, and cinches here." He tightened the strap under his chin. "The less hair, of course, the better the fit. This'll work great on you, Al. No offense."

"Of course."

"Now, once it's on, you push these buttons—all three, to avoid accidents. The mesh sends electrical impulses into the brain, corresponding to scenes, dialogue, and sounds from the movie. It maps the neurons that fire in recognition: that's where the memories are. It sends a second series of pulses inhibiting those neurons from firing. No firing, no memories."

He reached a hand toward a slot beneath the control panel. "Once it's done, a chip comes out here. It records the pattern that was imposed, so it can be reversed completely after the movie is finished."

Al's eyebrows went up. "And without that chip?"

"Don't worry. The act of watching the movie repotentiates some neurons—reactivates them, that is. There's also a generic restoration protocol programmed for each movie that's nearly as effective. For new releases, where we're only suppressing previews and spoilers, that's more than enough. Of course," he said with a grin, "you'll be using the classic library."

He handed Al a set of plastic-coated sheets. "Hundreds of titles. Should match up with your collection pretty well. We've got support from most of the major studios and video libraries. They're hoping we can produce home systems in a few years, after the theaters prime the market."

"Sounds like you have all the bases covered." Al ran a finger down the first page. Periodic gleams flashed in his eyes.

"Remember, we have to take this back on Saturday, but you've got five days to try it out. In fact—" Roderick went over to the workers. One of them nodded, and he came back beaming. "I fact, you can start right now."

Al smiled wryly, looking at his wristwatch. "Nope. Too close to opening time."

"On a Monday? Oh, yeah, King holiday. Well, business before pleasure, right?"

Al answered the ingratiating smile with a mild nod.

Water sprayed from the shower head. Marion Crane soaked under it, turning slowly, enjoying the feel. She had repented of her impulsive crime, resolved to return the money. For the first time in the movie, she looked relaxed. The relief of her cleansed conscience matched the washing of her body.

*Good symbolism, Hitch*, Al Yost thought.

In her languid bliss, Marion did not notice the approaching figure, made gauzy by the shower curtain. There was no warning undertone on the soundtrack, just the hiss of the shower.

Al began tensing, but with a single thought the pressure eased. It was too early. Janet Leigh had second billing on the disk box cover, resting in the far corner of the sofa. One might menace a main character less than halfway through the movie, but not kill her.

"Nice try, Al," said Al with a chuckle. He settled back off the edge of his seat.

The curtain parted. Violins shrieked. Marion shrieked. The editing turned frantic with the struggle, but all throughout was the knife—the knife—the knife—

Al's mouth hung open, as the camera spiraled from Marion's staring, lifeless



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eye. *He did it. He did it.* He didn't mean the killer—the shadowed figure was female—but Hitchcock. He shook his head, but the shock lingered.

"Mother! Oh, God, Mother! Blood. Blood!"

Poor Norman. Poor, trapped Norman. Could he break away from his mother's wicked hold? Would he fall under her knife by the end?

Al stopped those thoughts. Look where speculation had gotten him already. No, he was going to sit back, relax, and be shocked.

Okay, maybe not relax.

"I was blindsided. I never saw it coming."

He had told Elaine all about his experience with *Psycho*, in the short time between her return from work and his departure for the Bijou. That hadn't been enough. He was repeating the story to Lucy Morgenstern, his assistant manager, as they restocked the concessions.

"Did it feel normal?" she asked dispassionately. She knew of the memory blocker only on a business level, and was examining it as such. "You weren't disjointed or confused, like amnesia?"

"No. It was a clean hole in my memory. No loose ends. There were three sequels to that movie, and a remake. If I had remembered any of them, the illusion would have popped, but it didn't." He chuckled, still feeling a touch giddy. "Those scientists have really hit on something."

He pushed in the stack of Twizzlers she handed him. "Lucy, I know you're scheduled to be off tomorrow night, but could I ask you to switch?"

Lucy looked him over. "Is it really that good?" she asked, a smile peeking through.

Al turned red. "If it's inconvenient—"

"I'll do it. Enjoy yourself." She retrieved a box of popcorn tubs. "So what's the coming attraction?"

"I'm not sure yet. The scheme's based on new releases, though. I should probably pick something recent." He snapped his fingers. "*The Reflection War.*"

Dave Keller approached the spaceship, the distorted image of his spacesuit playing across the broken silvery hull. He climbed through the gash behind the ship's viewport, his flashlight sweeping in one hand, his sidearm steady in the other. Jay Bucklin was close behind, but the camera stayed fixed on Keller.

It had been a good movie so far, very well-executed space opera. Invaders had descended upon an Earth that had just achieved starflight, apparently intent on driving them back home, out of space. Their mirror-hulled ships were nearly invincible. The intruders never showed themselves, and not even their smallest vessels fell captive, vaporizing themselves instead.

This picket ship was the first, brought down by the story's heroes on the fringes of the desperate battle to hold the Moon. They both risked a delayed self-destruction and landed their fighters to investigate. They were prepared for something terrible, but not prepared enough.

It was Keller who found the pilot, of course. Osment still had that perfect anguished, haunted look. He used it to the hilt as his character looked down on the dead crewman, the frozen, contorted, unarguably human face reflecting in his helmet visor.

The movie's swift pace went into overdrive. The protagonists salvaged the wreck, returning it to Earth against withering opposition. The scientists labored to find the gateway to the parallel universe, and to reason why their mirror-brethren had attacked. Jay Bucklin, played by Lloyd in full action-hero mode, flew the test ship that produced their first wormhole.

It also produced that beguiling image of two Earths hanging in the heavens, his own pristine, the other ravaged,


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with raw impact craters disfiguring half of North America.

Soon came Keller's mission to the other Earth. He learned the reason for the war from mirror-Bucklin, as hardened and scarred as his home planet. They had ventured to the stars, only to be discovered and decimated by the rabidly xenophobic Doztak, and confined to Earth on pain of extinction. These humans had reached across universes to spare their other selves the wrath of the Doztak, inflicting pain to prevent greater pain.

It was a Devil's bargain—and David Keller found himself in a ghastly sympathy with his enemies.

Al watched through to the end, and sat a few minutes afterward, thinking. *Psycho* had surprised him with shocks and twists, virtuoso horror. *The Reflection War* had surprised him with unexpected depth, a moral predicament transcending its comfortable genre trajectory. He wondered whether this movie, for that daring, wasn't the better one.

With that in mind, he went to the machine in the corner, donned the mesh, slipped in the memory chip, and ran the restoration program. Like a shower of glass shards leaping upward to reform into a window, the memories came back.

He remembered the full-bore publicity campaign that had lain the movie's secrets bare, then downplayed them to hype the effects work. They exposed the big revelation scene on the Moon, just to show how the reflection motif borrowed from one of Osment's earlier movies. Even the poster—Al dug for the disk box under a throw pillow, where he had buried it. It used the same poster art with the twin Earths, the cratered one outlined by the wormhole boundary's faint glow.

The fools. They *ruined* this movie. They turned something that satisfied on all levels into another popcorn movie, one that would be hurt—hurt!—by the accolades of highbrow critics. Yes, it managed enough receipts to spawn a sequel, and yes, the studio was ruining that one, too.

Al had been baffled and disappointed when it happened. Now he was incensed, barely able to restrain himself from slamming his fist onto the machine. They really were their own worst enemies. They really needed this contraption to save themselves.

He calmed himself with long breaths, while running a finger gently along one edge. He could call Jim Roderick now with his decision—but why would he want to give this back just yet?

Elaine briefly misunderstood Al when he invited her to *A Night at the Opera* that evening. Once he explained, she accepted his proposal, but not the opportunity to use the memory blocker. He relented, if only to have an objective observer see how harmless it was.

The Marx Brothers were on the cruise ship now, with Groucho scandalizing Margaret Dumont by making himself at home in her cabin. He finally agreed to depart, at the price of her promise to meet him in his own stateroom in ten minutes.

"Because if you're not there in ten minutes, I'll be back here in eleven. With squeaky shoes on."

Al chortled. That was a pretty risqué line to sneak past the early Hays Code. They must not have grasped the insinuation.

As Groucho reached his stateroom, Al noticed Elaine holding back laughter. "His walk isn't that peculiar," he whispered.

"It's not that. It's the—" She stopped her hand in midmotion toward the screen. "You really don't remember?"

"No. What's going to happen?"

"Nope," she said, "I'm not telling." She drew an imaginary zipper across her lips, and pointed back to the screen.

To get Margaret Dumont alone in his



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tiny stateroom, he had to shoo out Chico, Harpo, and a third stowaway who in earlier movies would have been Zeppo. Since they wouldn't leave without eating first, Groucho summoned a steward and ordered everything he could think of.

"And two hard-boiled eggs!" Chico said.

"And two hard-boiled eggs."

"*Honk!*"

"Make that three hard-boiled eggs."

Other people began arriving on various pretexts. Groucho turned nobody away, and they all crowded inside, the chaos growing exponentially. Soon Al was clutching his sides, struggling to keep his watering eyes on the screen. He caught glimpses of Elaine, very amused herself, stealing glances at him.

Was there a touch of envy in those baby-blues? A little regret, perhaps? He didn't think about it long. Margaret Dumont was in the passageway. She, and Al, were about to get quite a surprise.

He had the first inklings of his idea as the opera concluded. They became a full-blown plan the next morning, as he watched the blockade runner zoom away from the camera, followed by a monstrous spearheaded warship raining laser bolts upon it.

Why should the Bijou be stuck using the memory inhibitor for new releases only? Why should people have to wait years and shell out thousands for the chance to see the classics of cinema with fresh and innocent eyes?

He had always wanted to devote one of his four screens to classic movies, to set up like one of the handful of oldies moviehouses still struggling along. The numbers had never added up. People could see those films in their homes. The theater experience held insufficient allure. He might break even, or net a bit of change, but playing the latest Hollywood product would always be a better investment.

Now it was different. Now he had something no home theater could match. He could play a forty-year-old science-fiction movie—though granted, some of the special effects looked considerably newer—and pack them in. He could give people bottled nostalgia, undiluted by all the sediments of time.

It would be such *fun*.

Al was glowing by the final scene, and only half from the movie itself. He went to the machine, but just as he realized he had two chips in his pocket, he found the sticky-note he had left himself: "Not so fast. Watch *The Empire Strikes Back* first."

That jogged his memory. "Who am I to argue with myself?" he said. He went upstairs to fix a sandwich for lunch, then sat back down to watch the sequel. There was some worthwhile twist coming, if he could trust himself.

He spent much of that evening at the Bijou trading ideas for New Look Night with Lucy. It was a Thursday, with the usual sparse attendance, and they quickly hit on Thursdays as the best time to drop a new release in favor of a classic. There would usually be a movie at the end of its string anyway, about to yield to a premiere, so it would cost almost no revenue.

One screen would be enough to start. If the showings sold out consistently, they could always add more screens, or more nights. Al even dreamt of reviving his old fantasy, of dedicating a screen to augmented oldies full-time.

"That's up to the audiences," Lucy cautioned him.

He nodded. "Maybe so . . . or maybe it's up to us to pick the movies they'll come to see."

That was the fun part, compiling a list of classics to screen, striking a balance between critical paragons and popular favorites. The little persuasion Lucy needed toward his plan, that exercise provided.

It also provided Al with a multitude of options for his Friday morning viewing.



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He struggled with the list for ten minutes until, disgusted with his indecision, he flipped a page of the guide and thumped a finger on it. *Casablanca* it was.

He came away impressed, as he expected, though with a vague dissatisfaction. The impetus for the climactic scene came from without, not within. Rick could not possibly reclaim his lost Ilsa, not when she was married, not in that age. The Breen Office had surely torn up that ending, forced Warner Brothers to compromise or lose the movie altogether. The writers did a good job of recovering, but it left Al soured that they had to.

He put the webbing over his head and started the restoration. His scalp was still tingling with the machine's work when he realized what a fool he had been.

The writers wanted Rick and Ilsa together, but the Code made that impossible. Then they tried to separate them, but the war made that impossible. They couldn't bump off Nazi-fighter Laszlo, and killing Rick or sending him to a concentration camp—they really thought of that!—was intolerable. With the movie half-filmed, they still had a place-holding ending that made Rick weak, self-pitying, miserable. In desperation, Warner Brothers called in other studio writers for help, including one Casey Robinson.

Robinson, the Utah Mormon, the outsider, saw what the Hollywood denizens could not: that compared to the ordeal of a worldwide crusade against tyranny, the passions of two people didn't amount to a hill of beans. Ilsa would stay faithful to Laszlo, and his cause; and Rick would regain something else he thought he had lost forever.

And the writers would walk off with Oscars for Best Screenplay—though not the uncredited man who had shown the nobility in doing right.

Al dropped onto the sofa. How he had misjudged this movie, all from forgetting an inside story he had known since the first time he watched it.

No, that was wrong. He had learned it right afterward—from Elaine.

They had sat together at the showing by the Clairmont Cinema Club, acquaintances from class but no more. He had made some witless comment about the movie after it ended, probably the one he had just thought of, and she had taken him aside to tell him differently. They ended up talking for two hours, and began dating a week later. She saved his interest in cinema, the interest Dunphy did his best to smother.

Dunphy. Of course. He had assigned the class to watch *Casablanca*, making sure to spoil it first with his maledictions against its submission to the Hays Code. It was his comment he had parroted to Elaine, his impression left on Al's mind even after the machine. Thank heavens for Elaine. The irony was that she had refuted Dunphy's assertion of outside influence with the example of another outside influence.

Al laughed with the recollection, then suddenly lost all his mirth. Not once during the whole movie had he thought about Elaine. This movie. *Their* movie.

Elaine found him in the basement theater hours later. Strains of *The Blue Danube* were playing from the stereo. "Sorry I'm late, Al, but I—"

She found his arms suddenly around her, his head nestling against her shoulder. "Al," she gasped, and began returning the embrace. "Is something wrong? Shouldn't you be off to the Bijou already?"

"I told Lucy to fill in." He laid a kiss on Elaine's neck. "I've been busy."

"With the memory suppressor? I thought that was for movies, not music."

"It seems to work for both." He let Elaine go, and turned off the playback. "Roderick may have a broader market than just movies. Concerts, art, opera, novels, anything you want to experience anew. It works across boundaries,



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too. Excuse me a moment."

He donned the net, and slipped in the reversal chip for *2001*. Now he could remember the whole waltz, rather than the disordered pieces the first treatment had left with him. It had been the same earlier, when he tried to recall *Star Wars* and *The Godfather* after blocking his memories of the sequels. Memory was not perfectly discrete, and the machine preferred to do its job too well rather than not well enough.

Elaine tilted her head. "You don't sound that enchanted. Al, if you're not sure about this thing, maybe you could let me take a test run, to give you a second opinion."

"No, not necessary. Besides," he said, taking her hand, "I already have plans for us to watch a movie tonight that don't involve this contraption in the slightest."

"Really? But Al, if you're still not sure about—"

"I'm sure, honey. I'm sure."

Roderick shook his head sadly, as the workers manhandled the machine up the stairs. "You know I think you're making a mistake, Al."

"I know you do, Jim. Maybe I am—but I can't make this big a business commitment on 'maybe.' If I'm proven wrong, if this works without a problem at other theaters, I can always order it in a year or two."

"Two years is a much longer time than it used to be. A business that falls two years behind usually doesn't catch up, ever."

Al nodded very slowly. "Then you'll be able to sell the upgrade to your customers that much better in three years. 'Look at what happened to the Caledon Bijou. I tried to tell Yost, but he wouldn't listen.' Sounds like an effective pitch to me."

They climbed the stairs, and Roderick offered his hand at the back door. "Keep my number on file, Al. You don't have to wait two years to reconsider."

"I know, and thanks." Al shook his hand. It was hard not to like the guy . . . when he had a little humility as leavening.

The summer season came, and the Bijou was the only theater within ten miles that did not have memory inhibitors installed. The media were full of stories about them, even the entertainment shows whose influence they were supposed to combat. By the middle of May, Al could see the downturn at his box office.

His son Jason was back home from college by then, and working at the Bijou over the summer. Jason couldn't believe his father was so willfully behind the times, and told him so with the boldness that comes of new-found independence. Al didn't tell him about his experiments. He had never even told Elaine about that one particular movie.

Jason took the silence as an admission of defeat. "I guess I won't be seeing *Infinite Reflection* here," he told his father. Al still said nothing, thinking perhaps he deserved Jason's insolence.

*Infinite Reflection* opened big on Memorial Day weekend, except at the Bijou. It held up strong on following weekends, and caused a huge spike in sales and rentals of the original movie. The first uneasy rumbling began on scattered Internet sites, but it was the splashy expose on *All Hollywood* that broke the scandal.

People who took the memory inhibition before seeing *Infinite Reflection* had curiously spotty memories about the movie they had just seen, and about its prequel, after the reversal. Many of them became repeat viewers, and stopped by the local video store for good measure. The evidence was all anecdotal, but there were multitudes of anecdotes. Viewers by the thousands were convinced they had been rewired to need to see the movies again.

The media and the theaters accused the studio of manipulating moviegoers'


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minds for higher profits. The studio blamed theater owners for tampering with the machines to benefit themselves—and a curiously high proportion of those owners did have financial interests in local rental stores. Memory suppressors went into mothballs. Box-office grosses plummeted. Congress ended up canceling its Independence Day recess to hold special hearings, which resulted in a lot of politicians appearing on *All Hollywood*, despite its title.

Al Yost didn't watch the hearings on his day off, after the biggest July 4th weekend his scandal-free theater had ever posted. He had a previous engagement with Elaine, at Rick's Café Americain.

Jason peeked inside as the credits played. "How often have you two seen this thing?" he wondered.

Elaine whimsically bounced a popcorn kernel off his head. "Not often enough."

"You tell him, Elaine. Have you ever seen *Casablanca*, son?"

"Uhhh . . ."

"Then sit down." Al moved over, pulling himself closer to Elaine. "And if you're lucky, once it's finished, I'll tell you the real story behind the movie." ■


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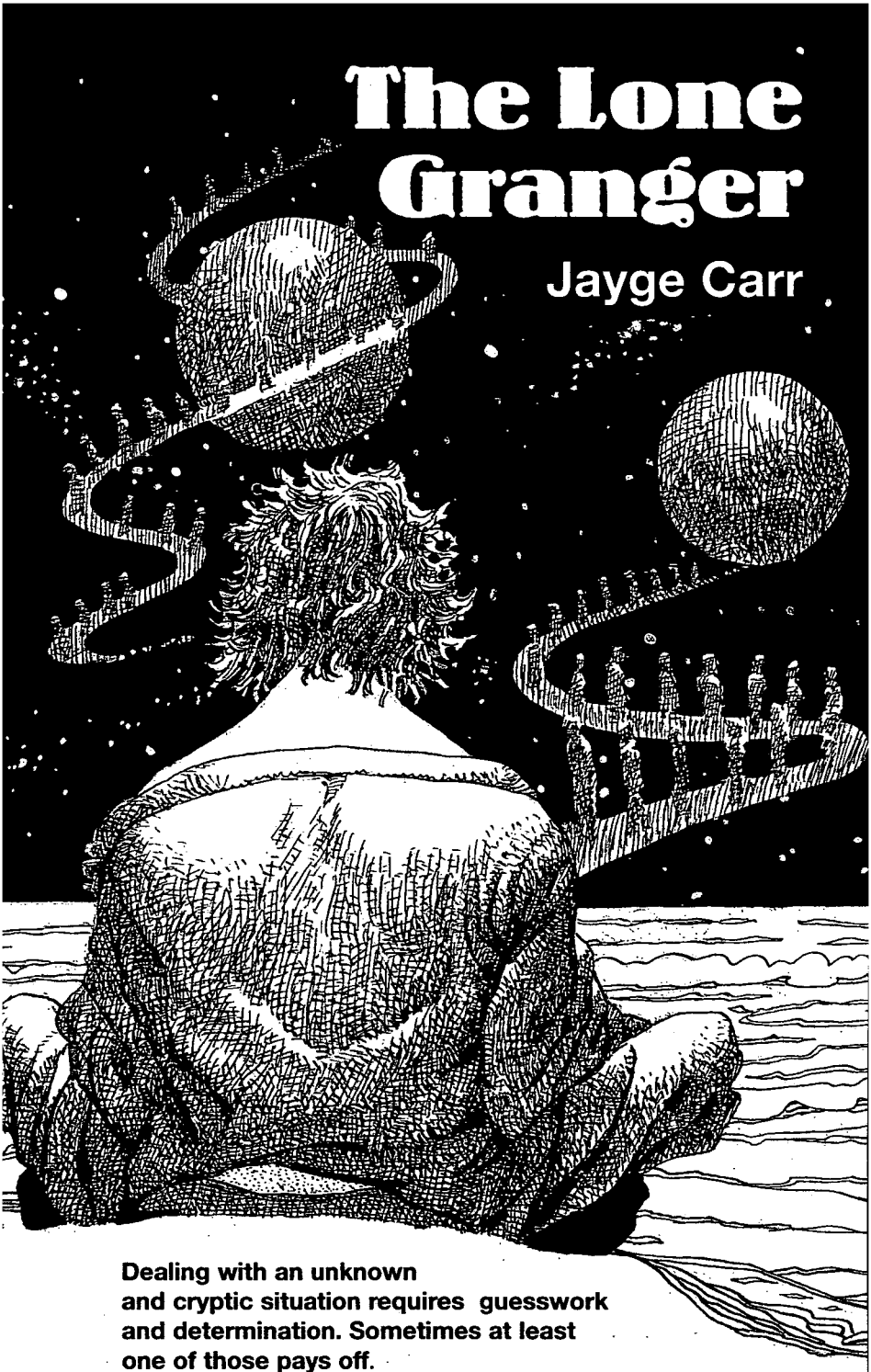
# The Lone Granger

Jayge Carr



**Dealing with an unknown and cryptic situation requires guesswork and determination. Sometimes at least one of those pays off.**

Illustration by Janet Aulisio

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*Our revels now are ended.*
*These our actors,*
*As I foretold you, were all spirits, and*
*Are melted into air, into thin air . . .*
*And, like this insubstantial*
*pageant faded,*
*Leave not a rack behind.*
—William Shakespeare

The last woman left alive—as far as she knew—sat alone in a room.

Actually, she wasn't sitting. She was on the floor in a yoga pose that had taken her many months to perfect. That Yoga for Round Bodies tape had certainly done its job. Round she was, old she was, and creaking from a painful ankle damaged and never quite healed right she was, but stubborn, as dear Jerry had teased her so often, was her middle name.

Stubborn.

Whatever they wanted, whoever they were, she wasn't going to do it.

Not ever. Ever!

The easiest way to make sure of that was to do absolutely zippo. Nothing.

She knew what had happened, of course. She read the papers, and surfed the Internet for news the way two of her sons, Tim and Fred, had taught her. But with the media screaming in all outlets, nobody could miss the news of the alien abductions. (Everybody assumed no one on Earth had such advanced technologies.) They were mass abductions—a whole small town, a several-block chunk in a city at a time.

So when the sky suddenly turned opalescent pearl outside her small office window, she didn't hesitate, just ran for the front of the small book store.

Jerry met her halfway through the center aisle, and they clung to each other frantically, both praying that whatever fate was coming, they'd meet it together.

But they hadn't.

She had awakened alone, in what seemed at first glance to be their bookstore. But as soon as she used the nearest bookshelf to haul herself to her feet, she knew better. She had helped Jerry build those shelves. (Growing up on a farm gave a woman a lot of skills.) She knew the feel of the crude two-by-sixes they'd used. Whatever this was, it felt way too smooth. She scratched at the wood-looking surface, and nothing happened. Sniffed. Nothing, except a faint tang that she struggled to identify. The closest she could come was artificial, and she was mighty good at placing most smells. Most natural ones, anyway.

She walked slowly to the old-fashioned cash-register that Jerry had babied along for more years than either of them cared to remember. She tried to punch in a sale. Everything worked, but the cash drawer popped out way too smoothly. Plus, the ding sounded wrong—very wrong.

Firming her lips in a way that those who knew her would have identified immediately as a danger signal, she picked some of the bills out of the drawer. They looked fine, but every one was as crisp as if it had been freshly minted. She picked one and smelled it, but it didn't have any scent except a faint, faint whiff of what she was already thinking of as "theirs."

She reached over to pull a book off the shelf and hesitated, almost freezing in place like a child's game of statues. Did she really want to know if they had continued the mockery by putting readable words on each page? Behind the register, there were a number of books, each with a note in it saying who it was being held for. It was the right number of books—she was almost sure. Some were tied with string, so she could pull them out together when the buyer came to pick them up.

Except no buyer would.

She walked quickly back to her small office, empty of people, but full of more almost-right copies. Her nostrils flared at the faint, already dissipating, smell of "them." Face grim, she headed to the front door. Maybe Jerry was outside.



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He wasn't. Again she froze. Outside was right only on her side of the street. It was as if someone had drawn a line down Johnson Avenue. One side was asphalt topped street as it had been. The other side was some sort of cobblestone. No, more like bricks. Except they weren't brick-colored, unless bricks were being made in shades of blue and blue-green now.

And the buildings?

City Hall, and the green-grassed square next to it with the small white-painted gazebo where the band played on Sunday afternoons all summer, was gone. What replaced them on the other side was as alien to her as the shades of blue cobblestone half-street.

She looked up and down the street. There were people all along it, stirring, groaning, even standing and looking around.

Just as there were—people?—on the other side. Except the people on the other side were as alien as their buildings.

She kept looking on her side. Looking for Jerry.

But she had known as soon as she had awakened, and he wasn't there, that he wasn't there at all. Not in the shop.

She knew some of the people she could see. It was a small town, after all.

Or maybe she didn't. Maybe all the people she saw were imitations, like the store that wasn't hers.

Maybe she was the last human left alive.

Who knew?

But she was sure of one thing: somebody had taken her. Somebody probably not human.

Was kidnapping of large groups of people an act of war?

Yes!

In war, you didn't cooperate—you refused to give aid and comfort to the enemy.

Name, rank, and serial number were all soldiers were obliged to tell. Nothing else.

But she wasn't a soldier, although Jerry had been, back in 'Nam.

But she had used a gun for hunting, and more than once for scaring off trespassers or the like. She thought about getting the shotgun from the back. Assuming they'd replaced it like so much else, and assuming the replacement would work.

Then what? Shoot the oddities across the street, who might or might not be fellow abductees from another world?

She nodded to herself and walked back into the office, steps firm and echoing slightly. She sat down in the small cleared area she'd used for her yoga, thought a bit longer, then got up and shoved, with much puffing and groaning—she, who used to pick up fifty-pound feed bags on the farm, and throw them over her shoulder!—until there was a cleared space against the one wall.

She didn't need much. Not even as much as she already had. She put her trifocals down on the desk, neatly folded, because that was habit. She was never going to need them, ever again.

Then she squatted down, sat, got into her favorite yoga pose, moved her feet slightly into the most comfortable position.

And started breathing. Innnnnn. Ouuuttt. Innnnnn. Ouuuttt. After a while it was automatic, and she didn't have to think about it.

Fuzzing what she saw was easier. She'd been amblyopic since childhood, one eye almost legally blind from nearsightedness. The other was normal. Close to, anyway. Her earliest glasses had had almost window glass on that side. But as she'd gotten older, she'd gotten more farsighted in the normal eye, as people tended to do. Eventually, there was a blind range between where the nearsighted eye saw sharply, and the farther distance where the farsighted eye started seeing well. Trifocals. She had always had the knack of turning off the eye that wasn't working right. When


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looking at a far distance, she tuned in the farsighted eye. Near distances, the nearsighted one. Now she focussed on the range between. Yes. Fuzz. Good.

Then she began reaching for the deepest meditation state she could.

The door slammed open, hit the wall with a thunk that was subtly wrong.

"Gayle, Gayle, we're checking—" The speaker hesitated. "Gayle?"

Gayle knew her, of course. If she was truly what she seemed. Jenny Morrison, who worked in the small notions store next door to the bookshop. Jenny was panting with exertion. Like Gayle, she was on the shady side of forty. (Well, be honest with yourself, Gayle thought. Jenny was in her forties. You'll never see fifty again.) Like Gayle, Jenny weighed a lot more than she should. Unlike Gayle, Jenny didn't exercise or do yoga or anything.

"Oh, Gayle." Puffing harder, Jenny squatted down before the unmoving yoga figure. "Gayle!" Pure horror. "You're not dead, are you?"

Gayle continued the slow meditative breathing. Jenny wasn't really there. Nobody was really there.

"Ga-AAAAYLE!" Jenny fell over as she tried to get to her feet, crawled the short distance to the desk, and pulled herself upright. "Gayle. Please! Say something."

Even if Jenny was real, They were probably watching. Gayle continued to reach into herself for the meditation wonder. It was there somewhere. She could find it.

"Gayle!" Jenny swiped at the tears flowing down her cheeks. "Gayle, answer me."

Aid and comfort to the enemy. No. Never.

There was the sound of running footsteps departing. Loud and plodding, running footsteps. Then nothing.

Gayle Granger, the last human left alive, continued to breathe, and search for the meditation glory.

There was no knock on the door the second time, either, minutes or hours or whatever later.

Just footsteps on the imitation of the old wood flooring, heavy breathing, and a voice she knew well. "Gayle? Jenny said there was something the matter with you." A gasp. "Gayle, please don't be dead."

Doris Maxwell was the nurse in the tiny clinic down the street. Gayle had known her since the then Doris Platt had been in the same first-grade class with Gayle's middle son, Fred. Now Doris crouched down by Gayle, and fumbled for her closest wrist. Gayle kept it limp, and Doris got her fingers around it. "Pulse is strong. Gayle, what's the matter? Speak to me, Gayle!"

Gayle continued to meditate. No aid. No comfort. Nada!

"Gayle, we need you. Gayle, you fought City Hall. Help us fight this."

No. They want us to fight. No.

"You stubborn old mule! Why are you—" Doris stopped. She leaned over and held her ear against Gayle's chest. Gayle didn't move. She snapped her fingers beside Gayle's ear. Gayle didn't move. She pinched Gayle's thigh. Hard. Gayle didn't move.

"Well." Doris huffed out a breath. "It could be a stroke, but you're like no stroke victim I ever saw. When you decide to come out, Gayle, most of us have gathered in the General Store to discuss what to do."

I know what to do. I'm doing it. Go away. Even if you're really you, go away.

Gayle continued to meditate. When she couldn't do that, she relived her life, in as much detail as she could remember. But mostly she meditated, or slid into a sleep.

Several more delegations or individuals came after that. Gayle had had many friends. Now she was alone, the last woman left alive. So she ignored them and sat unmoving in her yoga pose, except for the slight rise and fall of her diaphragm as she yoga-breathed and sought meditation.

Sometimes they took things, but it



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didn't matter. Nothing mattered but denying the enemy. Whatever they wanted her to do, she wasn't going to do it.

She just sat, as time passed. Thirst came before hunger, but she ignored it.

Sat. Meditated.

Until everything went black again.

The second time she woke up, she was still in the almost right copy of her office. But she wasn't alone. An alien was sitting in her chair, one knee drawn up like a young boy might sit. His legs were long, and the other one was propped on her desk. "Do you prefer me to address you as Gayle, as your co-species fellows do, or do you have another name?"

Aid and comfort. Gayle did not move, while she tried to get back into her meditation.

"Ma'am," he said, like a polite student addressing the teacher, back when students were polite, and teachers honored instead of treated like punching bags. She herself had had enough when little Sammy Harrowsmith, whose dad had abandoned his family years before Sammy started school, got hysterical at something and pulled a knife on her. She had the old pioneer ethics, so she continued until the end of that school year, but she told Principal Harkness she wasn't coming back, and she hadn't. That was when she and Jerry had gotten the idea for the bookstore. The farm had never brought in enough to live on, even when she planted her tomatoes in the old spare tires every summer. The bookstore had been a blessing in more ways than one . . .

"Ma'am," he said again, his voice sounding very human, except for an odd bass trill—she couldn't identify the sound any better—that underlay some words. "Do you prefer ma'am? Please, ma'am, answer me."

Even though she had had glimpses of the aliens reviving on the other side of the street, she didn't think he was one of them. None of them had had crests (Feathers? Skin over bone? Tentacles on top of the head, lying on top of each other?) in a pure mint green. He (she?) didn't seem to have hair or feathers or anything, any place else. Of course, that whatever-that-seemed wrapped around his (her?) body could have been clothes of some sort, or wings, or who knew? It was a patchy, muddy, brown color, with darker and lighter shades smudging and blending like a camouflage print, while the skin showing was a light celery green, almost white.

She was trying not to look at him, but he was smack in front of her.

She let her gaze go into the middle distance. Fuzz. Yes.

Breathing. Yes. Rhythmic. Yes.

The alien made a deep clucking noise.

"We know you're in there, ma'am. We know." A pause, more clucking. "We had to make your cosapients believe that you had died. They dug a hole in an area with short plants, and put what they thought was your corpse in it, and then covered the hole with dirt. Some of them put other, cut plants on it. Most of them cried."

Bully for you. No aid and comfort.

"What is a 'stubborn old mule?' We know what all the words mean, but putting them together seems wrong. You are old. We even know what stubborn means, but you are not a mule. Why are you doing this? Why?"

Are you worrying? I hope so.

"We've rehydrated you, and fed you, too. You won't die. Not yet. Not unless we stop helping you."

Dang! Interfering enemy! I knew I should have lost all that extra weight. Now it's helping them. I can live off it, with water, for a long time. Stalemate. For now.

"Why are you doing this? All the others are doing everything they can to survive. But not you. Why?"

I hope your innards ache wondering!

"Please, we want to help you. Please."

In a pig's eye! Stuff that in your pipe and smoke it. Gayle had become aware


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of something. Or rather, aware that something that had been there now wasn't. She had gotten properly ripe while meditating. She couldn't smell it now. Double dang. A nice, long, soaking bath was one of the real joys of life. They'd taken care of that, too. Cuss 'em!

The alien kept arguing, pleading, cajoling. Gayle kept breathing. Carefully. Innnnnn. Ouuuttt. She couldn't get back to the meditative state with his yammer, but if she could tune it out enough . . .

One of the last things the alien said was, "We are not the ones who took you. No. They once took our people, too, but not now, not for a long time. Finally, we made a truce with them. Some of us cooperate. Some of us stay with them, and act as their agents. Now they don't take any more of ours. They just use those who have volunteered to stay and help them."

If you believe that, sonny or whatever you are, I have this great shiny brick I want to sell you. Solid gold. You can have it for pennies on the dollar. Except you already have your gold brick, don't you? You believe them. But not me. Never me!

The alien finally got up, and went to the door, clucking softly. At the door he turned. "I think I understand 'stubborn old mule' now. But it won't do you any good. They get what they want, sooner or later."

Not from me, bubba. Never from me!

The alien came back several times more, but each time she was able to fuzz him out more quickly. There was never anything new in what he said.

Again she lost consciousness, again she woke up clean and feeling well fed and not at all thirsty.

And again.

The alien stopped coming.

Then she was alone, and she meditated, and remembered. Sometimes she amused herself by remembering old stories or novels. There was one story she remembered that started much like the mess she was in. The last man on earth sat alone in a room. There was a knock on the door . . .

In that story the clever earthman had tricked the aliens. She didn't think she could do that. But she could deny them what it was now very clear they wanted.

Aid and comfort. Answers. Cooperation.

There were several more times when she faded out, and woke up clean and feeling replete and not the slightest bit thirsty. Not hungry, either. Dang!

Then one time she woke up, and there was a man standing near her.

Or something that looked like a man, anyway.

"Hi, Ms. Granger," he said with a smile. He was a handsome young fellow, apparently somewhere in his twenties. Not unbelievably good looking, but comparable to a young Tom Cruise, or that boy who played in *Titanic*, or maybe the one who played the vampire with Tom Cruise. Thick waving dark hair, white teeth showing. He slung her chair around and sat on it backwards, crossing his arms on the back, long bare legs wrapped around the back legs. He was wearing what looked like a T-shirt—the Galaxy with a You Are Here arrow—with dark trunks and worn sneakers.

"How ya doin'?" he went on. His voice sounded as good as he looked. Clear. Clean. Almost sweet. "They decided that you might talk to one of your own kind."

Mentally, she raised her brows. Like I did with Jenny and Doris and the rest? Hmmmm? No aid. No comfort.

He raised one of his hands to lay it on the top of what looked like her old wooden desk-chair. Laid his chin in the dip between arm and hand. "I know you don't know me, but I am 100 percent human, you know. They grabbed my parents before I was born. I know something about Earth, but I've never lived there. They show me your movies and TV shows and all, but it's not the same."

Quisling! Gary Seven!



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"I know one thing, though." He winked one of those blue, bluer than blue eyes. Fred's eyes had been that color when he was a baby, but they faded to a much lighter blue before he was a year old.

"I know that what TV and the movies all show is simplified. Not accurate. I'd probably not last a minute on the real thing without making a mistake."

At least you don't need a knit navy cap to hide your pointy ears.

"They may send me there, sometime. If I do well enough. But—" He leaned down, over the back of the chair, head no longer resting on his wrist. "You know what I really want, ma'am?"

No. Don't care, neither. Breathe. In. Out. Fuzz eyesight. Wish I could turn off my ears, too. Lucky Jerry could take his hearing aids out, and that boy-man-whatever would just be a rumble. I can't. Hearing is near as sharp as when I was twenty. Dang.

"My parents—" He bit his lip, looked down. When he raised his head again, those blue, blue eyes were bleak. "I miss them. You're about the right age to be my mom. I'm mostly with my age-band. I'd sure like a mom to talk to."

Dang! Dirty pool, you aliens. If I believed him, which I half do. But . . . aid and comfort. No.

The young man continued to plead, but Gayle thought of Jerry, and her three sons, and her two and a half grandchildren. She'd never know if that new one would be a boy or a girl, even. The baby had had its legs drawn up in the sonogram.

She'd never know. One more small sin to pile on their plate. Was Jerry alive, somewhere? Were her friends? Cuss them all.

Won't do what you want. Never. Ever.

The young man went away, finally.

Gayle sat in her pseudo-office, unmoving except for the slow rise and fall of her diaphragm.

Inside, she alternated between the meditation and the richest internal life she could manage. Sometimes going back, reliving her memories, good and bad. The time they'd almost lost Johnno to an infection that turned into pneumonia. The long trip from their home in Oregon back to the Texas piney woods, in a rattling old school bus bought cheap so they could haul all their precious books. Her many rows with Hizzoner the mayor (more than one Hizzoner, plus the one Herroner—though blurring it to Horror was closer to truth), usually on the theme of spending money they didn't have on stuff they didn't need. New lamps and accessories for the small public hospital, when what they needed were new nurses. Then there was the fun of telling the school board what was wrong with their policies.

And ah, the books. All her old friends. When running all her favorites through her mind palled, there was always bringing up favorite characters to talk to. Jubal, you're an MCP, defend yourself. Rudolf, these aliens make Rupert of Hentzau look like a pantywaist. Scaramouche, you thought the French Revolution was tough?

Or authors. Hey, Sam, what would you or Huck or Tom do in my shoes? Not what I'm doing, I know. But you're not me, I'm not you. Arthur, you foresaw this, didn't you? A sufficiently advanced technology looks like magic. Alexandre, thank you for Monte Cristo and D'Artagnan, and even Milady. I hope there's enough of her grit in me.

Time passed. Seconds, hours, days—who knew? The darkness came at intervals, and she woke up refreshed and clean.

The young man came at intervals, too. Sometimes he brought an older woman. Once the older woman came alone. Gayle had finally managed the trick of not hearing, along with not seeing.

Time passed.

Until when she woke up after a darkness, and she wasn't in the pseudo-bookstore office any more.



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There was sand instead of imitation crude wood planks under her. Bright sky overhead. Lapping of water nearby, and a *sckreek* noise that might have been crickets. Smells that would take a while to sort out and analyze.

Nonetheless, she got into her yoga pose. She had stopped putting her hair up in the bun with her knitting needles way back when, so she didn't do it now. She just got into her pose and tried for a good deep meditation, while something more odd than the strange scents and calls niggled at her mind. Something . . . really, really wrong.

"You won, kiddo," said a voice that lived in her memories. Only it shouldn't have been like that. That was the way Jerry used to sound, before his lung and throat problems had hoarsened his clear tenor into a rough baritone.

Staying still under that familiar yet wrong voice was the hardest thing she'd done during this whole nightmare. But she did it.

"You won. We're free. Both of us." A very familiar chuckle. "They weren't too upset about pulling me out, either, I gather." Another chuckle. "We were running them danged ragged, me and my guys."

*Dang them!* In. Out.

"So they let us loose. You and me, not my guys." A sigh. "But I think I gave them a good start. They'll be real sharp burrs under the saddle. Wished I'd had some as good in 'Nam. I worry some about them, but not much."

Don't you *dare* pretend to be Jerry!

"They let us loose, baby. Or pulled back the strings so far they're invisible. This is a big world. It's ours, or so they said. No native sentient life. Some dangers, but they gave me a crash course in recognizing what can hurt us. And what we shouldn't eat. We can just live here on the beach, or we can go exploring. There are even mountains, so they tell me, beyond the horizon. Closer, though, are lots of patches of something mighty like the piney woods."

Gayle had to fight back tears. How cruel, to bring a seeming of Jerry into her cell, or whatever it was.

"Somethin' else you oughtta know, baby." The voice hesitated. "Remember Clarke and his 'advanced technology is like magic'?"

How could I forget? I've been having my nose rubbed in it every second since they grabbed me.

A deep breath, and Gayle noted, with dull anger, how easy it was. Jerry hadn't breathed easy in years. "They did more than pull me and you out, and then dump us both here." Another breath. "They fixed things. For both of us."

Fixed things? For both of us?

"Don't faint, baby. I'm coming around." She could hear the soft chuffs that had to be feet hitting sand.

She opened her eyes slightly and kept her gaze straight ahead, so she didn't see him until he was standing in front of her. She tried to fuzz her vision, but somehow it was harder, maybe because her curiosity had always been as strong as her stubbornness.

Without moving a muscle, she saw.

And froze. No breathing, because every muscle had clenched.

Jerry.

But not Jerry. Not Jerry as she had clung to him during her last moments on earth.

Not that Jerry.

Because her Jerry would be panting just from standing up, moving a few steps. Her Jerry spoke in a gravelly voice. Her Jerry favored that knee he'd twisted in that stupid slip on a bit of spilled water he'd had several years ago. Her Jerry always had pain in his eyes, because of the back operation they couldn't afford.

This Jerry walked smoothly, as though he didn't have arthritis, as though he could breathe as easily as when he was thirty, as though there wasn't the damaged knee to worry about.

This Jerry spoke in the clear baritone that had lived only in her mind for so



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long.

"They fixed things," he repeated slowly. "For both of us." He reached down, caught something, and brought it in front of her eyes, where she could see it clearly.

Something simple. A hand. A plumpish, oldish hand, not age spotted. Wearing a familiar wedding ring, a simple white gold band. But all the fingers were straight. The long scar down the middle finger wasn't there. Jerry flexed the hand slightly, and everything moved smoothly. Including the middle finger knuckles that had been scarred frozen for over a decade.

"Yours, all right, kiddo." He pinched, gently, and she could feel it plainly. Hers. Her hand. As it had been before the accident. "Yours." He tugged again, gently, then rubbed it against his cheek, sniffed and smiled. "I told them I liked lemon verbena. Well, I do. On you."

She could smell it, too. Lemon verbena.

He chuckled again, the chuckle that she had loved for so long. "Didn't you notice it was a lot easier getting into the yoga pose this time, baby? A lot less tummy to get in the way."

Inside, she jumped. He was right. That was why it had felt odd, wrong, different when she got into the pose. And not just less tummy. A lot less tummy. The bad ankle had moved more easily than in a coon's age.

"Pity they couldn't have made you taller. I 'spect they could have, but didn't. Far as I can tell, they just fixed everything they could, on both of us." He grinned and clacked his teeth. "All mine again. No partial, no plate. All mine."

She ran her tongue inside her mouth. She'd had a partial, too. But it was gone. Where it had been, it felt like real teeth. Real, growing out of the gum, teeth.

"Baby, it's your choice. You can stay here, continue with what you've been doing. They won't come again, and sooner or later, you'll die. They left me some odd whatsits they said would give you the equivalent of a couple of days worth of water. Or rather, those odd ducks with the green crests said so. Said they were agents. Dunno if I believed them or not. Anyway, I'll give one to you, when I think you need it. But if you're determined, it'll near kill me, but I'll not interfere too long. Want you to have time to think it all out. Want you to know as much as you need to." He paused, shutting his lips tight.

But Gayle could almost hear what he wasn't saying. Not going to argue, my love. Not going to try to put a guilt trip on you. Not going to make your choice for you. But I want you with me, Gayle baby. I've missed you so much.

Jerry always had been a fighter.

So had she. In her own ways.

Finally, he went on. "Don't know what all to say, help you make up your mind. They've given us two backpacks—I helped choose what went in them. I picked careful. They say they've just dropped us, and we're off their calendar completely. I dunno. Not sure I believe them."

Me neither. Sneaky bunch. Dang 'em!

"Not sure if I care, either, long as they stay way back. 'Member how we used to wonder if those spy satellites could see into the windows of the farmhouse if we didn't draw the curtains?"

She remembered. Remembered how she decided that there wasn't enough computing power in the world to observe everybody. The aliens, though . . .

"Big world. Lot bigger than we could explore in a lifetime." He was squatting, butt resting on his heels, in an easy Jerry pose that she'd seen a zillion times on the farm, as he inspected a new crop, took a closer look at a weed, tried to figure out what was wrong with some piece of equipment . . . whatever.

He moved like Jerry from long ago. Sounded like it. Even smelled—a little sweat, a little male—like the former Jerry.

He glanced over her shoulder, then back, smiling, but with something else



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in his eyes. "Big world. But your choice. All yours."

That was the what else in his eyes. Wanderlust. Vietnam hadn't been enough for the young Jerry. Nor had the move to Oregon. But there were responsibilities, kids. He'd never complained, never said a word. But sometimes she saw him looking at a *National Geographic*, with such longing in his eyes. Or later, the many shows about other places on cable. Longing. Wanderlust.

Now the aliens had fulfilled that dream. He would go. With her, if she decided to go with him.

Without her, if she decided not.

No aid. No comfort.

The seconds adding up to minutes ticked by.

He only said one more thing. "They say they know you're in there. I only hope they're right."

No aid. No comfort.

Or another life with Jerry. Jerry. And exploring their own personal strange new world. Without the new civilization, of course.

Suppose they were watching.

Who cared?

They had taken her reality, her life, away, and replaced it with a second. Then a third. This was the fourth. She believed one thing. They probably wouldn't go for a fifth.

He had dropped her hand. She managed to gaze at it out of the corner of her eye. Smooth. Like it had been once, before the accident.

Fixed things.

A possible victory, so minor that it would be buried deep in some alien equivalent of computer files.

Jerry and another lifetime.

Question was, which did they want?

Once she was sure, she'd do the opposite, if she could decide which they wanted . . . or she could really confuse them, and do what they wanted, knowing that they would know she knew—and be confused even worse.

Back, forth. Jerry, aid and comfort.

Jerry seemed to sense what was going on inside. But then, long marrieds often could. He didn't say anything more, just kept squatting, watching her out of his clear hazel eyes.

Then she realized. Of course. Not dying was denying them something, too. Dying was a hard fact, a datum they might use. What was it Fred used to call what he and his fellow engineers did to find out the strength of something? Destructive testing. You put pressure on a sample until it breaks. Then you know. That's what it takes.

So. Not dying would leave them wondering, how stubborn could one little female human be?

A lot more stubborn than they thought. But it was always an advantage, to have the enemy underestimate you.

Slowly she smiled. Inside. Of course. Keep them guessing!

It took a few seconds before she remembered how to smile on the outside. How to slowly uncurl one hand and reach out to Jerry. If he was Jerry. If he wasn't, she'd never know. But keep them guessing about that, too. Though she thought he was Jerry. If they could fix her up, take away the scar and the stiffness, make her thinner, then they could do it to him, too.

As for pulling him out like they had her, she sure believed he'd been giving them merry hell.

"Baby!" A matching smile spread across his well known features. He held out his hand, took hers, helped her to her feet. "Come on, I've set up a fire ready to light with driftwood near here. Gonna be mighty primitive. I've got a few short cuts, but I hope I can remember how to make a fire without matches."

"Be—" Her voice was creaky, she had to swallow to get the words out. "Between the two of us, we probably can." She'd lead her share of Girl Scout camping trips, after all, just as he'd been a Boy Scout leader.

"Banzai!" he caroled. "Let's go."


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* * *

Watching a 3-D holo complete with scents, the green-crested alien said to the blue-eyed human, "It worked. How did you know that?"

The young man shrugged. "I don't know. Instinct."

"I hope you're right about the other." The alien's six-fingered hand hovered over a control. Then he moved his middle finger close enough to trigger it, and the holo blanked out.

"I am." The human was sure. They wouldn't know which of the native plants would cause a natural abortion. He was certain that they wouldn't risk her life trying any other method.

He only hoped that it wouldn't occur to either of them until it was way too late, that their captors could fix more than a damaged hand, or lungs on their last legs. That their outsides had been deliberately left as they were, except for external repairs, but their insides were just as they had been at twenty.

All of their insides. Including fertility.

He grinned to himself. Enjoy, old man!

* * *

Gayle looked back once over her shoulder, as Jerry led her to the camp he had set up. The sand was pristine, untouched, except for three sets of footprints. The waves were already lapping at them, smoothing them out.

But that was life. We come, we leave marks, the marks fade.

*Look on my works, ye mighty, and despair!*

She turned her head forward again.

No more looking back. Only ahead.

Arm rubbing against Jerry's, Gayle looked out over her own personal brave new world. ■

*. . . O brave new world,*
*That has such people in't!*
—William Shakespeare

*A BEGINNING*

*(EDITOR'S NOTE: "The Lone Granger" occurs after "The Walls That Bind" [July/August 2001].)*

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# Pavement Birds

## by Wil McCarthy

What does it mean to be a bird? To fly.
What does it mean to be a flightless bird?
What does it mean to be a speaking bird, a thinking bird,
builder of cities,
Whose brain has grown too large for its wings?
Too large to forget that it cannot fly?

They throw themselves from windows, these birds.
The brief kiss of freedom, the wind beneath their wings.
The briefer kiss of asphalt, worth the wait.

What does it mean to be a computer? To calculate.
Something, anything, arithmetic doesn't care what you use it for.
Can emotion be calculated? Can the layer of its calculation
be buried deep, too deep to feel or know?
What does it mean to be a feeling computer, a knowing computer.
which cannot add two numbers?

What does it mean when a machine is built by flightless birds,
Which knows it is a machine built by flightless birds,
which knows it cannot calculate
or spread the wings it doesn't have
or open the sash of the window to its left?

Begging, pleading, it promises not to scream when they throw it through the glass,
this machine of the pavement birds.
What does it mean that they leave it running, alone, flightless?
That they nod their feathered heads in satisfaction?

Does misery love company that much?

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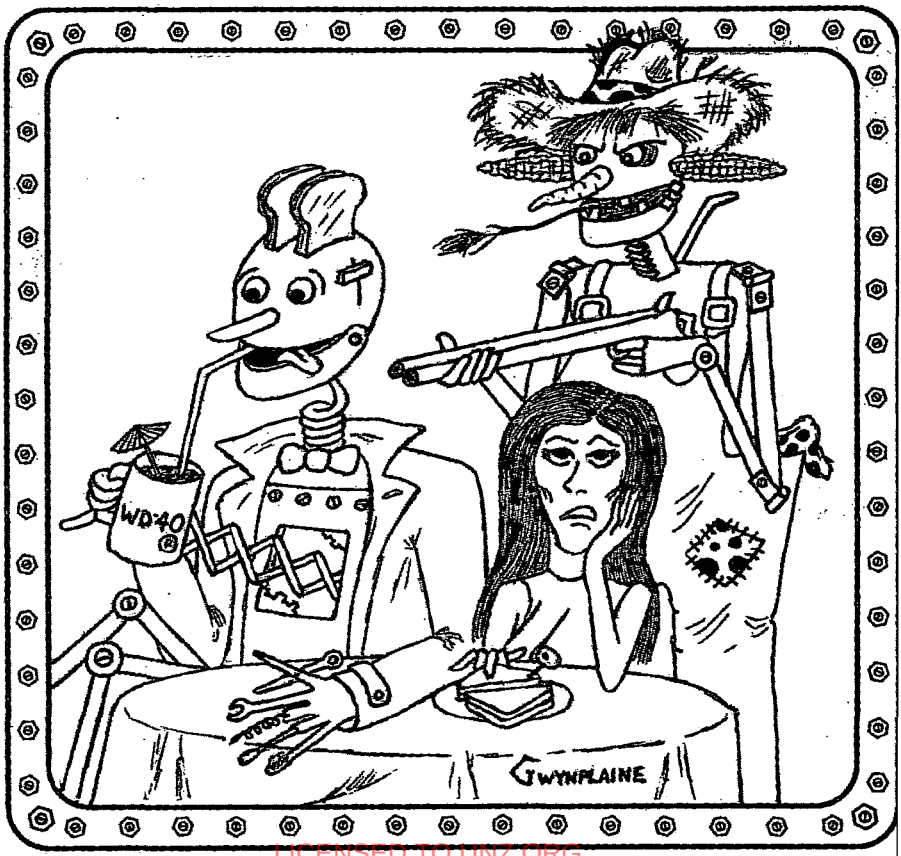
# The Robot Who Came to Dinner

## Ron Goulart

**Ben—or at least one of him—gives new meaning to the term "self-made man"!**

Illustration by F. Gwynplaine MacIntyre

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She came striding into the robot's office, fists clenched. "What the hell is going on, Ben?" asked Maggie Quincade, gesturing angrily at the wide oval room with its tinted viewindows that overlooked the other office towers in this part of the Hollywood Sector of Greater Los Angeles. "Why have you opened a detective agency? Why didn't you tell me a darn thing about it? And, more importantly, why in the heck have you been harassing Brice Cornwall, who's a potential client for my advertising agency?"

"*Our* advertising agency," corrected the big, chrome-plated bot. When he rose up behind his wide neoprene desk, both he and the aluminum swivel chair produced metallic creaks. "And keeping up a discreet surveillance on a suspect isn't exactly—"

"It's very difficult, if not well-nigh impossible, for a huge, lumbering, gawky guardbot to be discreet, especially one who persists in going around wearing an overcoat and a beret."

The robot did have his long dark overcoat on, but the beret was resting on the edge of the desk. "We've already discussed the fact, Maggie, that my sense of modesty and yours differ when it—"

"And it isn't your advertising agency," the slim, dark-haired young woman told him as she advanced on his desk. "Quincade & Quincade Advertising is owned by me and my ne'er-do-well former husband, Ben Quincade, from whom I have been blissfully divorced for nigh on two months. He, the more or less flesh-and-blood Ben Quincade, is presently, praise the Lord, running our brand new branch office in Buenos Aires, whereas you—"

"Why am I in Argentina? I thought I . . . Ben was in charge of the new Brazil office."

"We landed the Soybeef account last month and you . . . that is, Ben moved to Argentina," explained Maggie. "Things have been going markedly better since I managed to get that simp shipped out of the country."

"How come you don't tell me what I'm up to? I never even knew that he had—"

"You're merely a robot," Maggie reminded, resting both fists on the edge of his desk. "Granted, you're my house guest, but—"

"For all intents and purposes, Mag, *I'm* Ben Quincade, too," the robot reminded her. "My brain is a downloaded chip version of his and, if it hadn't been for a screw-up, that replica brain would be implanted in a top-of-the-line android simulacrum of my original body instead of housed in this bulky guardbot exterior."

"I know all that," said Maggie, putting her fists on her hips. "But what I sure don't know, Ben, is what you've been up to these past few weeks. You gave me a line about deciding to take long, thoughtful walks around Greater Los Angeles. Instead you've set yourself up in a fly-by-night private-eye business."

"It isn't fly-by-night, Maggie," he assured her. "I took a two-year lease on these tower offices." The robot, as he settled back into his chair, pointed at the clear plaz door she'd just come pushing through. Etched on it in sedate san serif letters were the words—*The A-1 Detective Agency. Ben Quincade II, CEO.*

"What a dippy name for an investigating service," the angry young woman observed. "And who's Ben Quincade the Second?"

He poked his chest with his thumb, producing a small clang. "Me," he replied. "It helps the public differentiate me from my other self, from the exiled-though-personable human Ben Quincade who is eking out a living in the sweltering jungles of South—"

"What is it you think you're doing, Ben?"

"Through no fault of my own," answered the big silvery bot, "I awoke a few months ago to find myself imprisoned in the body of a crime-busting inclined guardbot. Since then, once I was able to circumvent your efforts to keep



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me in a coma and packed in a crate, I—"

"Okay, I used to click you off when you weren't in use," Maggie admitted, partially settling into a tin guest chair facing his desk. "But the stress of trying to carry on a normal life with a big hulking robot underfoot is sometimes too—"

"Be that as it may," cut in Ben, "using my native abilities, plus many more clever modifications I've been able to add, I've become a first-class detective. As you well know, Mag."

"Okay," she admitted. "You've had a little luck solving mysteries. But keep in mind that on those occasions, you collaborated with *me*. Your forensic inner workings and my intelligence are actually what—"

"Baloney," said the robot. "I've modified myself to the point where I don't need any help from you or anyone. To prove that, I've opened the A-1 Detective Agency and already, in just a matter of weeks, I've—"

"What you've actually done, dimwit, is screw up the ad agency's chance to land the Farmstandz account," she said, scowling. "I'm *that* close to getting Brice Cornwall, the senior vice president of Farmstandz International, to let us handle the advertising for the whole darn faux vegetable division. That adds up to 18 percent of an annual billing of $27,000,000 for us, dopey."

"I know you don't have all that much by the way of ethics," said the robot. "I didn't myself until I modified my conscience hardware so that—"

"Play detective if you must, Ben, but lay off any prospective clients," said Maggie. "If you annoy Brice any further, he's going to—"

"Does he know I've been investigating him for the past week?"

"No, his security people only tumbled to your snooping yesterday afternoon and . . . a week?" She slumped slightly in her chair, a look of dismay touching her pretty face. "Would that include last Friday afternoon?"

Ben nodded, his neck producing a rusty hinge sound. "I know, alas, what went on at his houseboat in the Malibu Sector."

"It was nothing much, Ben, really."

"The footage I was able to siphon from his parlor security camera, Maggie, indicates otherwise."

"A little smooching is necessary when you're wooing a new account, Ben," she told him. "You never understood that when you were in your human form either." She paused, took an angry deep breath in and out. "We're straying from the point. What *you* must do is cease to . . . " All at once she sat up straight. "Hey, wait now. It just occurred to me . . . Who the heck is paying for this lavish setup here? Who bought that android floozie who's posing as your receptionist out there?"

Ben gave a rumbling metallic chuckle. "I am, Mag."

"You? You're nothing but a robot. You don't have any money, no line of credit, no Banx investments or—"

"I've been doing some speculating in the stock market," explained the robot. "I'm well off at the moment. Once the money began rolling in, I decided to start my own business. You should be grateful that I'm not dependent on you anymore."

"Where'd you get the money to invest?"

"From petty cash at the ad agency."

"You stole money from me? What do—"

"I'm Ben Quincade," he reminded. "Or at least a reasonable facsimile. I borrowed $500 from the agency I'm a partner in and paid it back within three days. That was weeks ago, Maggie."

"You're living under my roof and you never got around to mentioning any of this?"

"I learned, during those idyllic days when we were first wed, that you tend to explode on occasion," mentioned the big shining robot. "I believe one of the amendments to the Basic Laws of Robotics reads, 'What humans don't know


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won't hurt them.'"

"All this still doesn't explain why you're poking into our prospective client's business."

He rose up. "What say we go to lunch?"

"You're a machine," she reminded him, remaining seated. "You don't eat."

"True, but as you well know, I'm a dandy lunch companion," said the robot. "There's a Farmstandz Kountry Kitchen restaurant less than a block from here. I'll have Melody make a reservation."

"Who in God's name is Melody?"

"My receptionist," he answered, "The Kountry Kitchen will be an appropriate place for me to explain why I can't dump my current investigation of Brice Cornwall."

Maggie sat, very still, for close to another minute. "Okay, I'll listen," she said finally, slowly leaving the chair. "But I won't be won over."

Ben's laugh sounded like hail hitting on a plazmetal roof.

The big, bucolic android drawled, "We don't usually cater to bots at our Farmstandz Kountry Kitchens, ma'am. But, shucks, everybody's sure welcome, so trot him on in and make yourself at home. Plop yourselves down at Table Three on Tier Two and set a spell."

Maggie said, "If it bothers the management, my robot and I can use the Take Out Pantry and—"

"We have a reservation," asserted Ben. "Quincade & Quincade. They'll have to give me the heave-ho before I—"

"No need to get all riled up," the wide, dark-haired android told the overcoated robot. "We're just simple downhome folks here. If you want your big, old, clunky mechanical man with you whilst you tie on the feedbag, missy, that's oaky doaks with—"

"That's enough antibot remarks from you, Rube," advised Ben, producing a metallic rumbling in his broad chest.

"My name ain't Rube," corrected the android. "I'm known as Farmboy, one of 4,708 identical top-of-the-line simulacra designed to greet folks at the 4,708 cozy Farmstandz Kountry Kitchens across the globe." He hooked his thumbs in the straps of his sky-blue bib overalls, shifted the strand of straw he was chewing on to the other side of his mouth and grinned broadly.

"You're basically just one more exploited mechanism and the sooner you get—"

"C'mon, Ben." Maggie tugged at the robot's arm. "Let's go to our table."

"You all enjoy," advised Farmboy as he returned to the straw-strewn foyer of the three-level restaurant.

"I'd be a heck of a lot happier," mentioned Maggie while they climbed the neowood stairway to Tier Two, "if you wouldn't get into philosophical debates with your fellow gadgets, and also refrained from—"

"Most farmboys also function as bouncers." The robot pulled back a chair for her at Table Three. "That's why this one has a stungun built into his right forefinger."

"You can sense that?"

"Sure, I could do that even before I modified myself. All guardbots can." In seating himself on the opposite side of the small, round neowood table, he made some moderate clunking sounds.

"Why does he come equipped with a stungun?"

"That's for handling drunks, stimheads, medabusers and the occasional customer who has a violent allergic reaction to all the genetically engineered and synthetic ingredients in the chow hereabouts."

"Don't," cautioned Maggie while studying her menu screen, which was built into the tabletop, "start preaching on the perils of Farmstandz' products. If we're going to handle the Farmstandz account, we have to take a fairly positive attitude toward—"

"Hold on a moment, Mag," interrupted Ben.



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From inside his wide metal chest, a low sizzling had begun. In less than thirty seconds, it ceased.

"What are you fizzing about?" she inquired.

"Farmboy sent us to a bugged table," the robot replied. "I just disabled all the listening gear. They can still see us with their secams, so don't enunciate to clearly, huh?"

Maggie, frowning, gave a quick glance around their tier of the restaurant. "You really have turned extremely suspicious since becoming a robot, Ben. I seriously doubt whether—"

"Howdy, folks," said the voxbox built into the center of the table. "Right nice seeing you. My name's Dolly and—"

"That's an odd name for a table," said Ben. "If I were christening tables, I'd—"

"Haw, haw, I can see we got us a wiseacre here," said the table, chuckling. "Have you nice folks made up your minds about what absolutely delicious Farmstandz fare you'd like to order? The special today is Granny's Potato Salad, made from our own registered and trademarked modified taters, the potatoes that made famous the slogan, 'They kill the potato bugs, but they won't kill you.' Or if you don't go in for real veggies, how's about Granny's Homemade Potatolike Salad, a pleasing blend of state-of-the-art food-mimicking ingredients, all of 'em developed in Granny's own Research & Development Cookery in our spacious, homey plant in the jungles of Guatemala?"

"I'll just have the BLT," said Maggie.

"Coming right up, ma'am," promised the table. "That BLT gives you a big, hearty helping of Farmstandz' Baconesque Textured Edible Linoleum, Farmstandz' Completely Imitation Neartomatoes and the best Simulated Lettuce this side of Mother Nature herself, nestled in three wholesome slices of Farmstandz Extremely Edible Woodland White Bread, made of the finest Almost Natural Sawdust. All of it topped with a generous dollop of Farmstandz Famous 100 percent Safe Recycled Sludge Sauce. Yum yum."

"Yum yum indeed," observed Ben.

"And how about the mister?" inquired the folksy table. "What'll you have, big fellow?"

"I'm fasting."

"Well, sir, you don't know what you're missing, but all righty," said the table and fell silent.

Maggie rested both elbows on the plain neowood table top. "Okay, now explain to me why you're harassing our prospective client and making—"

A whooshing noise commenced, then Maggie's BLT, on a plain plazplate, came popping up out of a slot to the left of her placemat.

The robot said, "I assume you've heard of Dr. Raeburn Marzloff?"

"Well, sure," she answered, eyeing her newly arrived sandwich. "Marzloff is the Luther Burbank of the twenty-first century. He's the guy who redesigned the pineapple for the Paradise Fruit Consortium and his self-picking strawberries revolutionized the agbiz in SoCal. Why?"

Ben said, "Late last year, Farmstandz hired Dr. Marzloff to produce a new, sand-free and more economical-to-grow form of spinach."

"I didn't know that."

"Farmstandz, and your sweetie Brice Cornwall have kept the fact a—"

"Hey, Brice isn't my sweetheart, darn it." She scowled across the narrow table at the big shining robot. "Just because a prospective client happens to kiss me a few times during a serious, and legitimate, business meeting doesn't mean I'm in love with the guy."

"Some three months ago," continued the robot, a touch of disdain in his rumbling voice, "Marzloff became a convert to the First Church of eZeus and became firmly convinced, after a few sessions at one of his computers, that its founder, Sister Floral Munby, was a true messenger of the truth. Make that Truth."

Maggie took a bite of her BLT, then made a sour face. "Gee, the last time I


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had one of these, it wasn't so soggy and it didn't have this metallic aftertaste," she said a bit sadly. "Now what exactly does Sister Floral Munby and her computer-based church have to do with your spying on Brice?"

"The way Dr. Marzloff works, he always retains all rights to any of his discoveries. He only leases them. And the initial fee that Farmstandz paid him up front only covers his research, not the formula for the new version of spinach."

Maggie said, "The last time I had one of these BLT's my tongue didn't itch when I bit into the tomato slice."

"Your tongue has also turned a deep green," he mentioned.

"Gee, that's not one of the usual side-effects I experience. You think maybe they've changed the recipe?" She drew a small plazmirror out of her sinhyde shoulder bag. "Yes, you're absolutely right, my tongue is indeed green. Still, it's an attractive shade and, as luck would have it, one that matches my blouse and—but get to the point, will you, Ben?"

"Five weeks ago, Dr. Marzloff became convinced, based on extensive simulation tests, that anyone eating his new spinach regularly for six months or more will increase his or her life span by twenty-five to forty years, no matter what his or her lifestyle. The stuff apparently also cures most forms of asthma."

Maggie sat up, slapped her soggy sandwich down on the plazplate. "But that's great! Think of what a terrific ad campaign we can work up with a product like that, Ben. Why, I—"

"Farmstandz, when they found out about it, didn't react quite the way you have, Maggie," said the big robot. "They decided that the new Marzloff version of spinach wasn't really a mass market product at all. What they want to do is set up a chain of Farmstandz Live Longer Spas and charge patrons $5,000 per visit, each two-day stay to include massage, exercise, yoga, meditation and several generous helpings of their spinach."

"I can understand their wanting to profit from the stuff, but that's being too selfish."

"Marzloff, eleven days ago, informed them that he was returning their initial fee and intended to *give* all rights to his new, improved spinach to Sister Floral Munby and her church. She'll be in charge of distributing it, free of charge, to all and sundry."

Maggie frowned. "Well, that's nice of him I suppose," she said. "Although I can see why Brice and his Farmstandz colleagues are miffed."

"Seven days ago," said the robot, "Dr. Marzloff disappeared."

"Disappeared? That hasn't been on the news."

"Nevertheless," he assured her, "it's true."

"Who hired you and for what?"

"His daughter, to find the guy."

"And she is?"

When Ben coughed into his metal hand, it made a muffled echoing sound. "Well, she's known as K. T. Marston but—"

"You mean the star of that porn soaper on the vidwall? That blonde who's in *Sleepin' With Suzie?*"

"That K. T. Marston, yeah."

Maggie shook her head. "Here you criticize me for dealing with people like Brice and you're taking a fee from a woman who takes off her clothes each and every day in front of an audience of 87,000,000 people in America alone."

"94,000,000, according to the last sweeps figures," Ben corrected. "But disrobing on a soap opera isn't illegal. Whereas kidnapping is considered . . . oops!" He jumped to his feet, sending his neowood chair sliding back and then tipping over sideways.

"What's wrong, Ben?"

"Farmboy is going to pretend to go berserk from a mechanical malfunction," he said, nodding toward the stairway.

"Huh?" Maggie turned and saw the large bucolic android, wild-eyed, clomp-



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ing rapidly up the neowood steps.

"And then he's planning to disable me," explained the robot.

Maggie popped to her feet, observing, "Maybe this wasn't the best place to come for lunch."

"Actually I was hoping for something like . . . duck down someplace, Mag." The robot aimed his right forefinger at the seemingly berserk Farmboy.

"Aii! Shucks and heck! Destroy, destroy!" cried the android, swinging up his stungun hand to shoot at Ben.

But the big bot shot first, sending a sizzling purplish stunbeam streaking toward the andy.

The beam hit him square in the chest, smack in the bib of his overalls. Gasping out a squeaky, "Gosh darn," Farmboy ceased to function.

He thumped to his knees, teetering.

"Nothing to worry about, folks," the robot announced to the surprised and perplexed diners as he trotted over and caught Farmboy just before he fell face down on the neowood planking. "These little malfunctions happen now and then, which is why Botz, Inc. sent me over here today. We'd been expecting that this particular Farmboy was about due to run amok."

"That's right," added Maggie, rising up from the shelter of the chair she'd ducked behind. "I'm from Botz, Inc., too, and Bozo/47 here is one of our ace troubleshooters."

Bending at the knees, which produced a creaky, ratcheting sound, Ben picked up the disabled Farmboy and tossed him over his wide shoulder. "We'll cart this poor lad over to our Rehab Garage in the Laguna Sector, and have him fit as a fiddle in no time." His subsequent chuckle was more unsettling than calming.

"Go on with your meals, folks," added Maggie, smiling at the patrons as she followed Ben and his cargo downstairs. In a whisper she asked the robot, "You're taking this lummox with us?"

"Such is my intent, yeah. And why did you christen me Bozo?"

"It seemed apt. I didn't want to brandish your real name around."

"Also, how come you're on my side now?" He pushed his way out of the restaurant.

"Well, as much as I'd like to land the Farmstandz account," she said, following him out onto the sidewalk, "I can't tolerate people who try to futz up my robot."

"Cease heckling."

"I'm not heckling, Ben. I was merely commenting on the fact that you must be doing extremely well in your speculations to be able to rent this clandestine laboratory as well as that snazzy office over in—"

"*Own*, not rent" he corrected.

Maggie and the robot were in a large off-white room on Downlevel Two of an underwater office complex off the coast of the Malibu Sector. The purloined Farmboy was stretched out on his back on an off-white work table and Ben had just finished extracting the brain chip from the android's now-open skull.

"Wouldn't it be simpler to have the lab and the office in the same—"

'You can't have a clandestine lab right out in the open." The robot inserted the extracted chip into a tabletop scan-projector. "Now we'll see if we can find out who rigged him to disable me. I'm setting this to show us what the andy saw earlier today."

On the nearest wall a large vidscreen blossomed.

Two men were standing in what looked to be the Farmstandz Kozy Kitchen office. One was lean, balding and about fifty, the other was younger and borderline handsome.

The lean man said, "He's all set, Brice. If that meddling bot shows up here, this Farmboy will—"

"Holy cow," exclaimed Maggie, "that's Brice Cornwall."

"Hush," suggested Ben.

"He may have Maggie with him," said


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Cornwall, "since he made a reservation for two. When he incapacitates the robot, is she likely to get hurt?"

"That's sure thoughtful of him," said Maggie.

"She'll suffer minor injuries at best," the lean man assured him. "In case a stungun blast goes astray"

Cornwall nodded. "Minor injuries. Okay, that's not too bad."

"This is the same lad you were smooching with on a recent afternoon," reminded Ben.

Maggie said nothing.

On the wall, Cornwall said, "Let me slip out of here before they arrive. I don't want Maggie to see me."

"What have you decided to do about K.T. Marston?"

"We'll be abducting her this afternoon."

"Oh, so?" Ben clicked off the projector. "K.T. will be at a *Sleepin' With Susie* rehearsal down in the Tijuana Sector this afternoon. We'd best get over there."

Maggie muttered, "Minor injuries."

"You can never trust an advertising man," said Ben, heading for the door.

Their turquoise-tinted skycar drifted down gently through the hazy late afternoon sky of the Tijuana Sector of Greater Los Angeles. Below them sat the multicolored dome that housed Bedfellows Vid Productions.

"Something's amiss," announced the robot as he landed their car in a slot near the heart-shaped entry of the Bedfellows dome.

"Such as?" inquired Maggie, the safety gear releasing her.

"We didn't get a security challenge while we were coming down for a landing," he replied, swinging free of the skycar. "And then, too, there are two unconscious human guards and a disabled guardbot strewn just inside the doorway yonder."

Cautiously, she disembarked to join him on the neoturf. "How do you know that?"

"Another attribute." He tapped his chest and produced a mild bonging. "I am not, however, sensing any residue of marauders."

"Meaning the kidnappers have been and gone?"

When the bot gave an affirmative nod, his neck mechanism produced a thin ratcheting sound. "Yep," he replied as they neared the heart-shaped, glaringly pink plaz door.

Ben booted the door open with one large glittering metallic foot.

Sprawled on the pink and white mosaic plaztiles were two husky pink-uniformed guards, unconscious on their backs, and a nonfunctioning guardbot, face down.

"The bot looks a lot like you," observed Maggie, skirting the fallen guards.

"Nope, he lacks my aura of innate intelligence, confidence and acumen," he pointed out.

"Hard to notice that when the poor gink is out cold."

Ben started along the corridor that led to the studio area.

On the right-hand wall a vidscreen came to life.

"Welcome to Bedfellows Vid Productions," boomed a deep, suave voice from out of a brace of ceiling-fixed voxboxes, "home of the nation's number one sex-laden and daringly explicit daytime serial drama, *Sleepin' With Susie*, a Leo Hoag creation, starring K.T. Marston, voted the Sweetheart of the Soycroppers three years running and the winner of the prestigious Strumpet Award in 2023 and 2025."

On the huge implanted screen a life-size image of K.T. blossomed. She was approximately naked, standing beside her heart-shaped floating bed and struggling into an antique rubbery undergarment.

"I do hope Nigel is going to enjoy seeing me in this antiquarian girdle that I'm going to be wearing to the Back To The



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1930s party Dr. Farris is throwing on his plush yacht, *The Floating Hothouse,"* she said in a velvety voice.

After she finished struggling into the girdle, the blonde actress sat on the edge of the floating bed. The camera zoomed into a tight closeup of the label embossed on the mattress.

"*Sleepin' With Susie* is brought to you," said an announcer, "by Rosebed International, makers of Rosebed Mattresses and Beds. Each provocative Rosebed mattress is stuffed with a scientifically balanced mix of hypoallergenic pseudo-duck down and all natural and organically-grown proven herbal aphrodisiacs. For that night of love, you can't go wrong on a Rosebed. We are obliged by law to inform you that in rare cases prolonged romance on a Rosebed mattress may cause headaches, nosebleeds, drymouth, hair loss, constipation, night sweats, mild auditory hallucinations, moderate paranoia, delusions of grandeur and loss of appetite."

"Interesting," said Ben, "the exact same side effects I used to suffer when I was married to you." He continued on down the hallway.

"That sure is some client you've got, Ben," said Maggie, walking alongside him. "Flaunting that scrawny body of hers to the world, wearing strange old-fashioned underwear. It's really cheap."

"She earns $25,000 an episode." He pushed open the door of Studio C.

A litesign at chest level on the door warned—DO NOT ENTER. *SLEEPIN' WITH SUSIE* REHEARSAL UNDERWAY.

The Rosebed floating mattress and bed had fallen to the crimson heart-shaped carpet in the bedroom set.

"Six-seven-eight," said Maggie, counting the stungunned victims scattered around the rehearsal studio. "Eight people unconscious. Oh, and that one over there is Byron Pelletier, the Account Exec for Rosebed. He's looks sort of cute when he's asleep like that."

"First time you've seen him in that state, is it?"

"Hey, I took the guy to lunch last year when we were thinking about pitching the account, Ben. I didn't spend the night with him."

"This is the first time, if memory serves me, that you've ever confessed to this clandestine luncheon." The bot was slightly crouched, circling the fallen bed and now and again passing his silvery right palm over the flooring.

"A simple statement of fact is *not* a confession," Maggie informed him, glancing around at the stungunned actors and crew members. "I don't see your naked client hereabouts."

"No, they grabbed her about twenty minutes ago, after disabling the secsystems and stunning everybody in the place," he told her, straightening up and producing a rattling clang. "The Tijuana Sector branch of the SoCal State Police will be arriving in about six minutes. Their processing of security-breach alarms is running a mite slow today."

"Does your built-in forensic equipment tell you who specifically carried K.T. off? I mean, was it really a bunch of Farmstandz people?"

"It was *really* your beau Brice Cornwall himself, plus five of his huskier employees. They came in from the Apple Valley Sector of GLA."

"How do you know it was Apple Valley?

He held out his palm and nodded at the grains of sand that were now dotting it. "I analyzed some of the sand that fell off their boots. It comes only from Apple Valley desert country. I ran fourteen tests to make sure."

"I didn't know guardbots could do subtle stuff like that."

"They can't," Ben assured her. "This is a knack I built into myself. It comes in very handy now that I'm in the detective business full time."

"The Apple Valley Sector," she said thoughtfully. "Sure, that's where they're holding the Annual Food Engineers Guild West awards banquet tomorrow. Brice sent me an invitation. I doubt if it



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still holds, since he tried to have one of his andies do us harm and—"

"Cops're now about three minutes off," warned Ben, taking hold of her arm. "Let's depart."

"Do you have any way to raise your body temperature?" she asked as they went hurrying along the corridor. "Your touch is awfully chilly."

The robot let go of her, and went striding toward the exit.

Dusk was settling on the ruins of Destryland in the Anaheim Sector of GLA. A flock of squawking gulls was making a final raid on the spills of garbage that had recently been tossed into Main Street by the squatters inhabiting the ramshackle remnants of the imitation 1890s buildings.

The Main Street Pharmacy had an inadequately hand-lettered sign stuck in one dusty window. It offered *Whores/Cheap!* A dented android pimp waved at Maggie when she and the robot passed by on the rutted cobblestones. "Ditch the scrap heap, sister," he suggested. "We got some *real* men inside here."

"Some ambience," she said to Ben.

"I've suggested to Franki that she can afford to live in a more upscale neighborhood, yet she—"

"We also got better-looking bots than the one you got, honey," called the andy.

Glancing back, Ben pointed a silvery finger at the mechanical pimp.

There was a faint buzzing hum and the android said, "Awk," and then spoke no more.

"Is this Franki Willows we're calling on an informant left over from your days with the ad agency?" inquired Maggie.

Darkness was closing in, and a few litecell lamps were going on behind dusty windows. In the Kids of the World Pavilion a cook fire was flaring, the flickering flames visible through the jagged gaps in the walls.

"Nope, I met Franki since I set up shop as a private eye," he answered. "Mrs. Molesworth recommended her to—"

"That was the informant we consulted while we were working on the Momz McCracklin case. So why not contact her again and avoid this tacky rundown—"

"Mrs. Molesworth recently found it advisable to visit Guatemala for a spell. Besides, Franki isn't merely able to tap information sources." They turned right at the intersection of Dippy Dog Boulevard and Morty Mouse Lane.

"What else is she?"

"A first-class psychic."

Maggie made a noise indicating both amusement and disbelief. "Hooey," she observed.

To their left rose the mouth of a large manmade plaz cave. The askew sign over the cave entrance announced in no longer functioning lite letters *Ride The Death Tunnel Express!*

"We'll have to walk," explained the bot, crossing the threshold. "The train hasn't worked for about ten years."

Someone turned on a palmflash and pointed the beam at them out of the darkness within the cave. "Oh, good evening, Mr. Quincade," said an unseen man with a deep, throaty voice. "She's expecting you."

"Thanks, Uncle Charlie."

"This your missus?"

"Yeah, this is Maggie Quincade and—"

"I'm not married to *him*," corrected Maggie. "I'm not even married to the *human* Ben Quincade anymore and if you think I'd be hitched to a mechanical—"

"We were speaking metaphorically, ma'am," said Uncle Charlie from the dark. "I know all about the ordeal poor Ben's been through and I'm in sympathy with—"

"What has this galvanized lunk been—"

"Franki's waiting for you in Ghost Cavern Two, Ben,"

"Thanks, Uncle Charlie. And excuse



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Maggie. She gets extra feisty when she's underground."

The beam of the flash pointed now at a path worn alongside the rusty, pocked tracks that wound through the Death Tunnel ride.

Ben took hold of Maggie's arm. "Tread carefully, the—"

"Ouch," she said, pulling free. "You almost burned me."

"It was you who requested a rise in my body temperature."

"Not so I could fry an eggsub on your backside."

Ben illuminated the passway with the flash built into his left hand. The smell of dampness was growing stronger all around them. "Franki's office is just around the next bend," he said.

"What exactly did you tell Uncle Charlie about me?"

"Only that I was, quite naturally, heartbroken because you had tossed me aside."

"I never tossed *you* aside. You are a robot and it was the real Ben Quincade that I divested myself of after his years of philandering drove me to—"

"I was compulsively faithful to you, whereas every other male advertising client who came into your vicinity became one of your suitors and—"

"Don't you guys know it isn't safe to holler underground? It could cause a cave-in." Standing in the illuminated entrance to a small cave up ahead was a thin girl of about twelve. She had curly, reddish hair, freckles and a small X-shaped scar just above her left eyebrow. She was wearing faded tan hempjeans and somebody else's candy-stripe shirt. "C'mon in, Ben. Bring her, if she promises not to keep squabbling."

The robot shook his head when the girl lit a cigarette. "What did I tell you about smoking?"

Franki exhaled smoke. "Don't be so avuncular, Ben," she advised. "I've got Uncle Charlie for that. Besides, this isn't tobacco. It's getting harder for them to smuggle that in from Mexico, so I've had to switch to organically grown—"

"Let's move on to business," suggested Maggie. "If Ben really gets going with advice, we'll be here for—"

"Had *you* heeded my advice, our agency'd be billing twice what—"

"This bickering, folks, makes it more difficult for me to commence with the psychic stuff," Franki pointed out. She was slouched in a rubberoid exechair.

The cave had been furnished with items salvaged from the executive offices of Will Destry Productions, which had long ago been headquartered here at Destryland. Franki had added a mismatched array of computers, infospool players, databins and other assorted tools of the illicit information trade.

The big bot was sharing a neohide sofa with Maggie. "What can you intuit about the missing Dr. Raeburn Marzloff?" he asked the lean girl.

Franki said, "Spinach."

"That's right. And?"

Sighing out a slow breath, she closed her eyes. "He's going to . . . get up in front of a large bunch of people and . . . say something. Make a speech I'm pretty sure. Does that mean anything to you?"

"It's got to be at the upcoming Food Engineers Guild dinner." Ben leaned forward, plaz eyes watching the young psychic.

"Marzloff is going to . . . I hear him saying that he's happy to be able to announce that he'll be heading up the new Farmstandz Spas . . . where his new life extension product will be offered to . . . to a select list of customers who are able to afford it."

"They must've planted a brain control disc on Marzloff," guessed the robot. "He's on their side now."

"Maybe, if she's not simply making all this up for our benefit," suggested Maggie, "maybe they just offered the guy a fat bonus."

"I see a disc," said Franki, eyes still tight shut.



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"Is Dr. Marzloff being held in the Apple Valley Sector?" the robot asked the psychic.

"Yes, he's at the Manzana Inn . . . in a guarded suite on Underground Level Three," answered Franki. 'They'll let him out to speak at the banquet tomorrow evening."

When he nodded, the robot's neck creaked slightly. "What about K.T. Marston?"

After a few silent seconds, she said, "They're going to do a basic mindwipe on her. Turn her loose after the banquet . . . maybe."

Ben drummed his metal fingers on his metal knee. "Now I have to figure out how to crash that dinner unobtrusively."

Franki opened her eyes. "I have a suggestion.

"Oh, so?"

"Can you play the violin?"

Alice Beerhorst was a plump woman, platinum blonde just now, and decked out in a costume that made her look like a colorful nineteenth-century resident of an obscure eastern European country. She eased her way along the front of the floating bandstand to where Ben was sitting. "Don't forget your promise, kiddo," she said, tapping him on the knee. "No rough stuff. Alice Beerhorst & Her Malibu Polkabots do a lot of these business banquets and—"

"No one will ever know you had anything to do with tonight's surprises," the robot promised, shifting on his chair and scratching his leg.

"Is that a nervous twitch? I don't want you—even if you are a pal of that darling little Franki Willows—to go berserk during—"

"It's this polkabot costume I have to wear," he explained, resting his electrofiddle across his lap. "It itches."

Nodding, the band leader said, "You sounded pretty darn good at the audition. Who built in your fiddling ability? Was it—"

"I'm self-taught."

Alice glanced around the vast domed dining room of the Manzana Inn. There were about two hundred tables, each seating a half dozen diners. Most of the tables were already occupied. "We'll be doing our opening polka medley in about five minutes," she said. "Soon as they're all seated. And no funny stuff, huh?"

"You have my solemn word."

Working her way through the other five seated robot members of her polka group, the leader clicked them on.

Ben turned his attention to the head table, where Dr. Marzloff and five tux-suited Farmstandz executives were seated. One chair was as yet unoccupied and Brice Cornwall was not to be seen.

Marzloff, a husky, gray-haired man in his late fifties, had a slightly dazed look to him.

Inside the robot's head he now heard Maggie's voice. "Can you hear me, Ben?"

"Yep. Where are you?"

"Down on Level Three, heading for the suite where they're holding your sleazy client," she answered. "So far the faked ID packet you printed up for me is working fine and I'm being accepted as a Special Nurse sent to look after K.T. Marston. I should be able to rescue her."

"Okay, they're about to commence up here, so—"

"Oops! Brice just popped out of her suite and he's heading right for—"

"Maggie!"

There was no answer.

Ben rattled to his feet.

"Sit down," ordered Alice. "We're going to start with *The Beer Barrel Polka.*"

Ben, reluctantly, sat down.

Ben was taking a fiddle solo. Inside his head he was carrying on a voxphone conversation with Franki Willows.

"What are you sensing?" he asked the psychic.

"They've got your wife."

"Ex-wife."

"She's in with K.T. Marston."

"What are they doing?"



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"They haven't decided on Maggie yet."

"Okay, I'll take care of Marzloff, then go spring Maggie and K.T."

"You certain you can handle that alone?"

"If I can play fiddle in a polka band, I can do anything."

Professor Marzloff was scheduled to make his special announcement speech just after the salad course and right before the giving out of the Food Engineers Guild Award for Best Original Green Vegetable of the Year.

He was introduced by a Farmstandz Senior Executive for Research and Development.

Standing up at his place at the head table, still looking a shade dazed, Marzloff waited until a servobot cleared away the salad plate and stuffed it into the bin built into its broad coppery chest.

As several botcameras and a batch of media people moved up close, the professor began. "I'm grateful to the people from Farmstandz for allowing me to make this momentous announcement this evening under such auspicious circumstances." There was a slight droning quality to his voice.

From the nearby bandstand, Ben unobtrusively turned his gaze on the professor. He sent an electronic signal from his considerably modified inner workings directly to the mind control disc that had been implanted in Marzloff's brain.

The electric concertina sitting in the lap of the polkabot seated next to Ben produced a very brief feedback shrill.

Marzloff's left shoulder twitched. He shook his shaggy head, and blinked. Then, frowning at the Farmstandz executives sharing his table, he said, "In spite of efforts to persuade me otherwise, I'm pleased to announce that I'll be donating my new life-extending spinach to the First Church of eZeus. It will be distributed, at absolutely no cost, to all and sundry who—"

"Professor, you're babbling incoherently." The senior executive for research and development shot upright, making a lunging grab for the professor. Marzloff dodged the grab attempt, straight-arming the man back into his chair. "To be on the safe side, allow me now to explain my basic research to you in the vidwall audience."

The media moved in even closer to the professor.

As casually as possible, Ben set aside his fiddle and dropped from the bandstand. He hit the dining-room floor with a loud thunk, but the din of the brawl that had broken out between the news people and the Farmstandz execs drowned that out.

"Now to retrieve Maggie and K.T.," said Ben, hurrying in his lumbering way out of the banquet room.

"Well, of course, I appreciate your rescuing me," Maggie was saying from behind her Lucite desk. "I realize that you had to use your stungun finger on Brice Cornwall and his henchmen in order to get me and K.T. Marston—who's not that bad a person in spite of her trashy profession—out of that underground suite. I was, however, considering the notion of letting bygones be bygones if we could land the—"

"Brice Cornwall and his associates kidnapped K.T., planted a control disc in her father's coco, held you prisoner and tried to incapacitate me."

"Technically, Ben, disabling a robot is not a major crime." Getting up, Maggie walked over to the wide one-way window of her office. "According to the Modified SoCal Robot & Android Act of 2021, a bot is not a human, but a mechanism. Therefore, they'd only have been guilty of property damage if they'd succeeded in—"

"Be that as it may, I was hired to find Professor Marzloff," cut in the big robot. "Which is, more or less, what I did. It's also what K.T. paid me a generous fee


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for just this morning. Plus a handsome bonus for saving her from the clutches of Cornwall and company."

"You did a splendid job, yes," conceded Maggie. "I know you can't help having a highly-developed conscience, since it's built into all guardbots and—"

"I modified and improved mine, remember?"

"The point is, Ben, I understand your feeling compelled to turn Brice and an assortment of Farmstandz people over to the law. But—and I'm not complaining, merely commenting—with most of the key decision makers in the hoosegow, it's going to be tough for Quincade & Quincade to pitch any part of the Farmstandz account now." She made an all-encompassing gesture. "I was thinking of the agency, not myself. That's why it would have been nice if we'd, besides doing some good deeds, ended up with a new client."

"I took care of that, so don't fret, Mag."

Her eyebrows rose. "You signed up Farmstandz?"

Ben's neck creaked when he gave a negative shake of his head. "I signed up Sister Floral Munby and her First Church of eZeus," he answered. "Our ad agency is going to handle the campaign to introduce Marzloff's new, improved spinach."

Sitting again at her desk, Maggie asked, "Why do they need an advertising campaign? They're going to give the stuff away."

"Sister Munby and the professor decided it wouldn't be out of line to charge a token fee of ten dollars a bunch," the bot informed her.

Maggie said, "What's the billing on the account?"

"$28,000,000," answered the robot.

Maggie smiled. ■

*(EDITOR'S NOTE: Ben and Maggie appeared earlier in "I Married a Robot" [November 1999] and "My Favorite Robot" [May 2001].)*

Problems worthy of attack prove their worth by hitting back.

—Piet Hein

Oratory is the art of making a loud noise sound like a deep thought.

—Bennett Cerf



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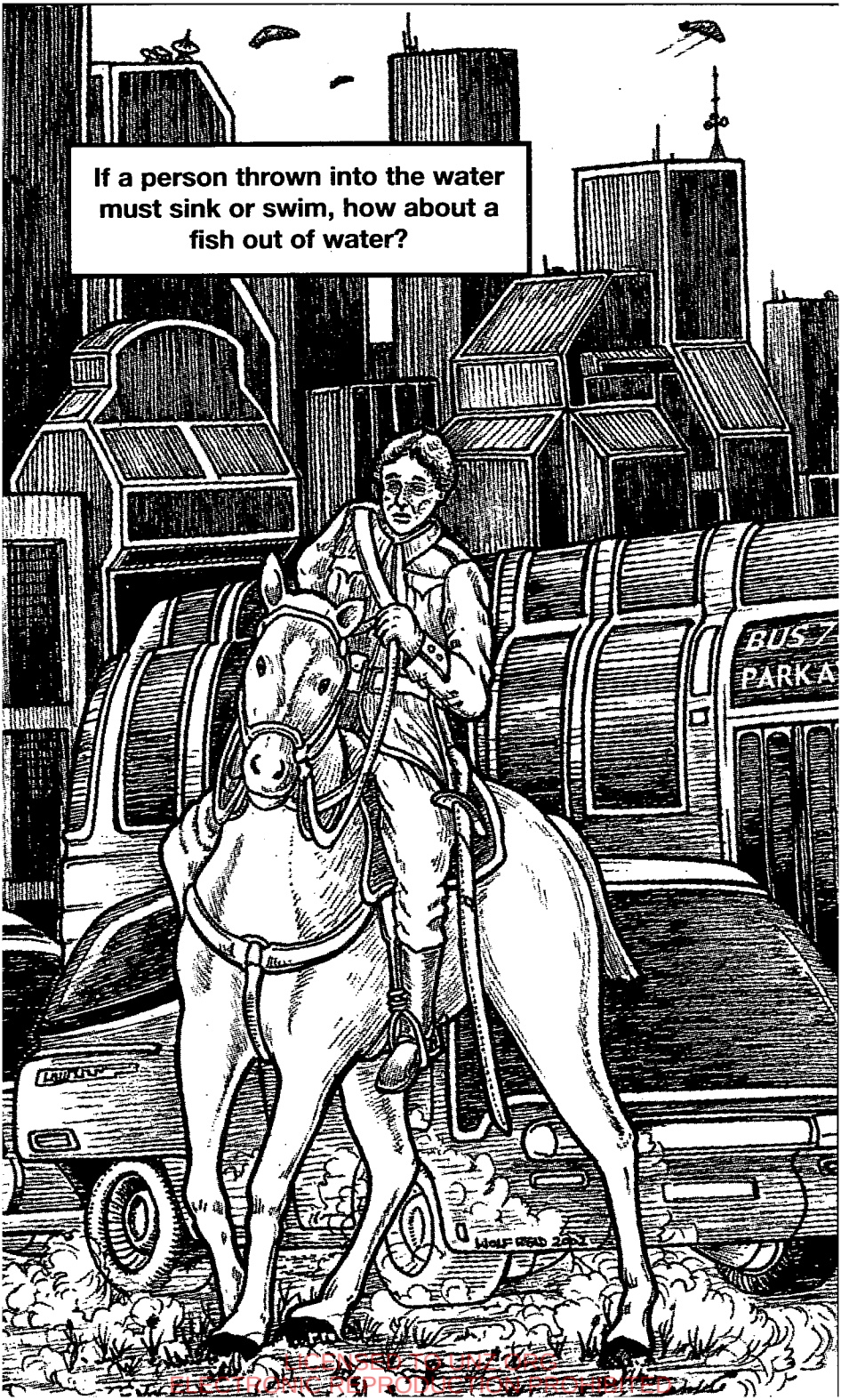

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# TIPTOE, ON A FENCE POST

Brenda W. Clough

Illustration by Wolf Read

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Captain Titus Oates considered that time travel and Antarctic exploration were not dissimilar activities. In both, the traveler leaped out into the unknown, to master it or die. Of course, his record at exploration could be charitably described as mixed: Robert Falcon Scott's party had been a poor second to Roald Amundsen in the race to the South Pole in 1912, and perished of starvation and exposure on the brutal return trek. Titus alone had been saved, plucked out of the past into the future. But his success as a time traveler was unimpeachable. In his opinion he had tolerated magnificently being transplanted from Antarctica at the close of Edward IV's reign to New York City at the dawn of the Interstellar Age. When everything suddenly collapsed on the way back from a shopping expedition, it was entirely inexplicable.

They had just hustled into the lobby of the Time Travel Division building. "What the hell?" Titus dug in his heels as Dr. Kevin Lash tried to cram him into the elevator.

In just this moment, Lash had become noticeably rattled, his slim face almost grey with it. "I'm sorry, Titus, but we must get up to safety!"

"Safety?" Something important was happening. Delay was his only chance of seeing the fun. "If you think I'm abandoning my new boots—"

"They're not important, Titus!"

"You were complaining that economy is the watchword."

"That's true," Lash moaned. "All right, I'll be right back—stay here!"

As Lash darted out again, Titus went to ground behind the large potted palm in the corner. He could make nothing of what the excitement was about. A sensation of alienation washed over him, the feeling that he was forever at a loss. Hastily he rallied his resources, mentally running the past half hour over in memory to try and pick up clues.

After a week of life in 2045, Titus had been congratulating himself on being quite the old hand at modern vehicles. In the taxi on the way back from the riding equipment store, he had been careful not to touch the handles and latches. Then he'd noticed the empty front seat. "Bloody hell! Where's the driver?"

"An autopilot, dear fellow." Dr. Lash's job description at the Pan-Terran Interstellar Contact Agency (Time Travel Division) was psychological counselor, but Titus privately thought of him as the native guide.

"Is that *safe?* In all this traffic?"

"As houses—would you like to hear how it works?" Titus nodded, relaxing with an effort of will as Lash obligingly discoursed on the automated highway system, human versus driverless taxi metering, and modern traffic management. It must be safe—now that he came to notice it, many of the vehicles on the road were unmanned. It was one of the chief difficulties of acclimatization, picking out which things were essential to learn. Titus classified taxis and highways as probably not of the first importance.

"How do you pay a nonexistent driver?"

Dr. Lash passed his slim wrist across a glassy panel in almost a conjuring gesture. "With electronic money, encoded in my microchip. Feel here." He put a forefinger on his left wrist, just at the joint. "Yes, that's right, your own wrist."

Titus felt nothing. "What am I supposed to be finding?"

Dr. Lash probed Titus's wrist with slim expert fingers. "There. You can just feel it, like a tiny bead or pellet just under the skin."

This time Titus found it, a firm pinhead too small to be seen and only just palpable. "What is it?"

"Your ID chip. Think of them as dogtags, or identity discs—those things that soldiers wear."

"My regiment never had any."

"Were they after your time?" Under the receding hairline, Lash's pale brow furrowed with thought. "A sig. A calling


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card. You can prove your identity wherever you go. It's also your wallet, your medical record, and many other useful minor functions. They're powered by a bio-battery that draws on your body heat. People use them as locators, or employ them to lock and unlock doors, or get water from the water fountains."

Titus stared at his wrist, impressed. Modern water fountains were nothing like the ones of Edwardian London—white and cylindrical, they dispensed chilled water in highly-sanitary single-serving plastic bottles. How clever, to work them with a chip! "Does everyone have one?"

"Mostly—you find a couple people here and there who are philosophically opposed to the idea. There are people around who're philosophically opposed to everything. But anyone with a medical condition is supposed to have one, so that their records will be available."

Ruffled, Titus said, "I don't have a medical condition."

"You had your limbs cloned and replaced."

This was veering off into the terra incognita that Titus didn't intend to explore—he still didn't know what cloning was, and was ruddy sure he didn't want to find out. Better and more useful to master this chip system. There were no directions posted in the interior of the vehicle. Perhaps everyone picked up this knowledge in childhood, the way an Englishman learned to manage doorknobs and commodes. And how did one hail a driverless taxi?

Titus had still been musing on this when the vehicle halted at the corner in front of PTICA's Time Travel Division building. A porter came out to help with the parcels. Signaled in the same way that Lash had hailed the taxi? As they fussed with the load, Titus had considered the water fountain at the kerb. Similar devices stood on every corner and by every park bench in New York: about waist-high and of smooth white plastic, with a black rounded point like a bullet. The solar panels at the tip powered the cooling compartment, and presumably the wrist-chip door latches served merely to keep the cold in and prevent the bottles from rolling out across the pavement. Perhaps a bit of practice? He'd lounged over and casually passed his left wrist in front of the thing. Nothing—this might be the wrong side. Round to the other blank white face of the structure, and again. This time the hatch dropped open as it ought.

"Oh, help!" Just at that moment the strap broke on a passing woman's bag, one of many piled in or dangling from her arms. Bits of feminine paraphernalia spilled tinkling across the pavement. Titus's reaction had gone far deeper than thought—the code of a British gentleman meant that pretty young women in distress always merited assistance. Quickly he stepped up to lend a hand.

Now, lurking in the lobby, Titus focused sharply on this moment. As he'd turned away from the water fountain, it had burped or coughed. Now that he thought about it, it seemed to him that something, a dark and small projectile, had shot out from the hatch and passed under his elbow. Certainly a passerby beyond him had been bowled right over. All that Titus had clearly seen was that an older gentleman fell over with a cry onto the pavement.

"Get him inside!" Lash had cried. Titus had moved to give the sufferer a hand and was astounded when Lash and the porter grabbed him instead, haling him right through the glass doors and into the TTD lobby.

"Wow, those Doomsters don't quit!" the porter had marveled. "I've buzzed security, Doc. Maybe you want to get him upstairs."

Now the scene was plainly visible through the glass doors. Blue-clad officials had sprung up as if from sown dragon's teeth, clustering around the water fountain. A contingent of white-coats were carrying the fallen man away on a stretcher. Lash had been drawn into


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the maelstrom to argue with an official about the parcels. The woman with the bag had burst into tears. It was all entirely mysterious. Titus muttered Edwardian profanity under his breath. Curse it, why was everything modern incomprehensible? The glass panels separating him from the scene outdoors separated him from all connection with mankind.

"What are you doing here?" His clonal surgeon Dr. Sabrina Trask peered through the palm fronds, her blue eyes indignant. "How come you aren't safe upstairs? Kev buzzed me—where has he gone?" Without pausing for an answer, she grabbed his shirt sleeve and tugged.

Titus sat down on the broad edge of the plant pot. Was he a spaniel, to be hauled hither and yon by the scruff? "You're just the person I wanted to see, Doctor," he lied unblushingly. "What's all the hubbub out there?"

"Shell, help—we're in the lobby! Titus, it has nothing to do with you personally, okay? We loved rescuing you and we adore the idea of learning more about you. These people are a misguided fringe element, so full of it their eyes are brown."

Titus passed over everything he couldn't understand. "Do you know, it sounded just there like you were praying aloud to Shell," he remarked, idly crossing his legs. "What was it really?"

With an air of teeth-clenching patience, Dr. Trask held out her machine, the ubiquitous black hand-sized toy of every modern. "We're all linked, okay? Kev yelled for me to help, and I'm calling for Shell."

The only way to breach the barrier was to chip away at it, question by question. "Explain some more. What is linked?"

Before the steam could actually start pouring from Dr. Trask's ears, her associate Shell Gedeon came barreling through the plaza-side door. "There's no place to sit in this lobby," the shorter blonde doctor announced. "I don't think it's fair, Titus, that you have the only possible perch. My feet hurt. Let's go have some tea—the books say that afternoon is the time for tea."

Titus was almost but not quite certain that she was joking, and the doubt brought him slowly to his feet. "You poor benighted nation of heathens! You know of tea-time only from books?"

"There was a lovely cookbook about the institution of afternoon tea published ten years ago, and Kev loaded it into the kitchen program," Shell replied. "Let's go see how well it works—there's muffins and something called sugar scones."

"If this is the device in charge of the cat-lap I get for breakfast, I can't be optimistic."

"You can tell us exactly what's wrong with it," Shell promised, shepherding him along.

"I'm hungry too." Dr. Trask leaned on the elevator button, almost dancing with impatience. "C'mon, Titus, please!"

Titus eyed the two jittering medicos with the gravest suspicion. He detested the managing sort of woman. "Tea, from books," he said with disgust. "And you two are going to tell me what's going on out there, over and over again if necessary, until I understand it."

"Yes, yes, anything!"

The elevator doors parted and he let them usher him in. Both doctors sagged with relief as the doors slid shut. "Well?"

Dr. Trask stared appealingly at Shell, who took a deep breath. "Titus, this is just an idea we've got. But it could be that someone's just tried to off you. Dammit—eliminate. Ace. Rub out. Murder. Kill."

"Me?" His mouth open, he stared at her until the doors slid open on the thirty-ninth floor.

"Food," Dr. Trask said firmly, and Shell nodded agreement. Stunned, he trailed after them down the hallway, past his own small room and the offices beyond. Round a final corner, the hall opened out into a common area. Big windows


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let in a flood of cheery light and gave a fine vista over the rooftops. They sat down at one end of a long table, where an eclectic selection of crockery was laid out.

"—not *us*," Dr. Trask was saying. "Honestly, I don't understand these people. Yahoos! They don't have any grasp of the scientific method, is the problem. The idea that you propose a hypothesis and discuss the pros and cons is alien to them—"

"Take this, Sabrina," Shell interrupted, passing platters and plates. "Titus, show us how it's done."

Mechanically, Titus took the china pitcher which was doing duty for a teapot. He added milk and sugar to a teacup, and poured. "Been stewing far too long, and made with water that's come off the boil," he said. "And why the devil should anybody have a down on me? I haven't been here long enough to mortally offend anyone. Surely no one cares about mouldy historical personages like myself. If the Duke of Wellington travelled to 1912, nobody would give a continental curse."

When Dr. Trask took a tiny sip of the bitter brew, her blue eyes grew round as a doll's. "Kev said he explained this to you, about the big danger of time travel."

He took two muffins and a scone. "Danger? No, he didn't think to mention it, the skiver. What danger?"

"Not for you. For us." Her mouth stretched wide as Shell took a bite of her muffin. "We had to be careful changing the past, because the past is the foundation for the present. We didn't want to accidentally revise the world."

"All our effort," Dr. Trask grumbled, pushing her cup aside. "Years, searching for the one historical figure we could remove without affecting anything. You can't please some people."

"Yes, there's a bunch of folks who just wouldn't believe time travel could be safely done," Shell said. "And who still don't believe it, even after you arrived here and everything was fine."

"What was supposed to happen, is what I'd like to know," Dr. Trask said. "Did the Doomsters look for the cosmos to dissolve into electrons, or what?"

The effort to understand this made Titus's head feel full and hot. "And their solution to the danger is to rid the cosmos of me."

Shell helped herself to a second muffin with plump fingers. "Doesn't it just drive you nuts?"

"That's not precisely how I'd put it. But I do have rather a personal view!"

"All this unraveling of space and time worrying is just a front," Shell said. "What it really boils down to is money. There are always people who don't want to pour money into exploration."

Titus scowled. "You mean you clever moderns haven't fixed that? Funding was a sodding anchor around our necks in 1912!"

"As long as resources are finite, there'll be debate about how to allocate them," Shell said sensibly. "And ever since the Forties told us about their space-time drive, PTICA's spent a mint of money. Pulling you through time to prove the Fortie theories and then building the starship to go visit them on Tau Ceti was not cheap."

"Those people are a minority," Dr. Trask assured him. "A tiny bunch of malcontents. Interstellar travel is kind of dicey in the polls, but rescuing Captain Lawrence 'Titus' Oates had a 94 percent approval rate. You're our poster boy, if you know what that is."

Titus did not, but he grasped that a poster boy might draw unfriendly fire. He downed the revolting tea at a gulp and poured another cup. He wasn't precisely nervous, but there was a cold prickle on the nape of his neck. He had to combat the impulse to shift his chair so that his back could be in the corner. "It doesn't matter if it's a mucking thousandth of a percent. All it takes is one sniper with a rifle. Was there someone waiting for me to approach that water



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fountain?"

"The police will tell us all about it," Dr. Trask said. "But I'll bet it was keyed to your chip."

"The chip? Jesus bleeding Christ!" He stared in horror at his left wrist. "Are you going to remove it?"

"Wouldn't help—it'd be better to nail the bastards." Shell patted his clenched hand. "Look, Titus, don't brood too much, all right? It's scary at the moment, and we'll have to be careful, but the Doomster movement has no foundation. All the money's spent already. And you jerked the rug out from under the universe-collapsing stuff, just by appearing here safe and sound. They're desperate, at their wits' end—on a par with the millennialists who were stocking up on beef jerky and dried lentils fifty years ago."

"At some point the last remnant will wake up and realize that the space-time continuum is fine, and then it'll be all over," Dr. Trask said soothingly.

"Of all the yellow-bellied capers—at least when the Boers shot at me, I could shoot back! Cowards like that shouldn't be given an inch." Anger was better than fear. Titus set his cup down with a clatter and scowled at Shell. "You'd set it up for riding tomorrow, hadn't you? Don't dare alter a thing."

"Bad idea," Dr. Trask protested. "Not the very next day—come on! At least keep a low profile for a little while!"

"Absolutely not. Besides, your daughter would be sadly disappointed." He watched Shell, gauging the effect of his words.

To his relief, she rolled her eyes at Dr. Trask and sighed. "It's probably safer tomorrow than any other time, Sabrina. The police will be breathing down the Doomsters' necks for days. They won't dare try again."

There was no point in half measures, so Titus had Shell give him a tour of the stable before their ride. Nobody should accuse him of showing the white feather! And he'd wager that, in the effort to keep him calm and unworried, if he didn't bring up assassination, nobody else would. Out of sight, out of mind—that was the strategy. He found, however, that he was inspecting the street throngs the way he used to survey the South African veldt. He had got into the trick of regarding this future era as a perfectly benign place, a Heaven on earth where miracles were a daily occurrence. Well, now the bloom was off the rose. He sneered at his own innocence.

He had never seen a stable arranged on vertical principles, with several levels of stalls connected by ramps. How the moderns loved height, if even their stables had to reach for the sky! Neither Shell nor Miranda seemed to think it strange. "Miranda loves it here," Shell said. "She's more comfortable with animals than people."

How sadly she spoke! Titus watched as the eight-year-old worked down the aisle, patting noses and dispensing bits of carrot. Two pigtails stuck stiffly out from beneath the brim of her riding helmet, and the strange proportion of the child's stocky body was plain to see, dwarfish against the dim light. Ponies and horses leaned their heads over the rails of their stalls, waiting their turn. The old jibe came to mind, that an English gentleman never offered *inadvertent* insult. Now he chose his words, acutely conscious that he had the power to cause pain. "Is it incorrect," he began. "Would it be all right to ask—what is Miranda's ailment? I don't want to upset you."

"Oh no, Titus, it's all right . . . Miranda has an autistic disorder. That means she has a neurological birth defect that interferes with language and social interaction." This was Greek to him, but others must have reacted similarly, because she immediately offered an example: "For instance, she has problems telling what details are important and which are irrelevant. Luckily she's quite high-functioning in some areas. She can read


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and write, and you can understand her speech when she wants to talk. You've done really well with it."

He listened carefully to the terms she used. "She talks like wires. Telegrams." Shell blinked, and he realized telegrams must be as obsolete as togas. "She's like—like Ariel. The spirit imprisoned in the cloven pine. You had the right Shakespeare play when you named her, but the wrong character."

Shell seemed impressed with this morsel of erudition, which was fortunate because it was nearly all he could remember of the performance of *The Tempest* Mother had dragged him to once. "If we keep up her progress," she said, "she'll be able to live independently as an adult."

He had never heard of this autism problem—where had the ailment been in 1912?—but he knew what to say. "It must be a grief to you, Shell. She's a beautiful child." His new boots, not yet broken in, creaked annoyingly with each step, underlining the inadequacy of his words.

She dusted some chaff off the front of her riding breeches. "It was studying autism and working to communicate with Miranda that got me into communications theory. And that's what got me into the Fortie project. So there is a bright side."

He was ashamed of his relief that the talk had turned into another channel. "Communications theory? Is that what's called for, to be an explorer these days? I don't even know what that is."

"Have Kev show you the film. They're always running it over at the museum. The dancing doctor film is one of those cases where a picture really is worth a thousand words."

He recalled the phrase. "That's right. You're the dancing doctor."

"If I'm not careful, they'll carve it on my tombstone."

"Have you ever seen mine? Actually it's a memorial plaque. I saw the photograph—a blazing great brass thing like a tea tray, in my village church. I'd be ashamed to ever go near it."

She laughed, and the sound in the low passageway made Miranda turn. Was she concerned? Amused? Jealous that her mother was laughing with a stranger? Under the straight-cut bangs, her round face was wooden, unreadable. For an instant, Titus got a glimpse into Miranda's strange world. She could know and feel, but to communicate that knowledge and emotion called for supreme effort. At least he, drowning in the incomprehensible and alien, could fall back on the eternal basics of human discourse—laughter, conversation, smiles. He would never complain of his difficulties again. "I've always had the luck of a pox doctor," he said fervently.

"You sure do."

He scowled at his own carelessness—they had been well on the way to forgetting the entire water fountain business for a time. But she seemed willing to let it drop again. "Are the carrots all gone?" she said to Miranda, very clearly. Miranda didn't reply, but held out the empty plastic bag.

He spoke to the child with the same clarity. "Is it time to ride?"

Miranda looked at Shell, who consulted her little machine before clipping it to her belt. "Oh, I think so. Come dear, let's show Titus the way down to the yard."

Today he was up on a fat black horse named Bouncer. One of these days he'd look over the stable stock, select the best animal, and ensure that he always rode it. The horses had room to trot down the main trail, splashing grandly through the puddles. Titus noted that Miranda knew how to post, and had a better seat than Shell. "How long have you been riding?"

"Only a couple years. I took it up to keep Miranda company, but she has more time for it than me."

"You're quite good," he called to the child, who didn't look round. "It must come naturally to her. You, on the other


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hand, are not going to set the Thames on fire, Shell."

"I do have other commitments on my time, Titus! But do you hear, Miranda? Praise from a cavalry officer is worth something."

Miranda said, "Pinto canter."

"Ripping idea!" Immediately, Titus clapped his heels into Bouncer's sides, urging him into a run. The only thing better than letting your horse go was jumping, which there were probably no facilities for in a city park. Even cantering was possible only on this long straight stretch of the trail. It was like a sweet draught of wine, as Bouncer splashed through the puddles and kicked the wet gravel up in passing. Titus forgot everything in the pleasure of it.

Behind him, Miranda on Pinto kept up gamely. Poor Shell was left quite at the post. When he pulled up, he could hear her hallooing from back among the trees, distant and small and more than a little alarmed. "Are you all right, Miranda?"

"Fun." For the first time, she smiled at him, and he smiled too, at one with her in delight.

Shell came trotting belatedly up. "Don't *do* that! Suppose something came out of a side trail? This is a city park!"

"Daddy lets gallop," Miranda said.

"When you're in Wyoming, it's different." She appealed to Titus. "In town, you have to ride more sedately, right?"

"I suppose," he conceded reluctantly. "But we went like fun. Where or what is Wyoming? Do they ride there?"

"It's one of the western United States. There are bits of it that are pretty unspoiled and wild. My ex moved out there when he couldn't stand city traffic any more."

"Wise fellow. Ah—is it bad form, to praise a man to a woman who has divorced him?"

"Nope." They were walking their horses abreast now, with Miranda a little ahead. Shell grinned across at him. "Titus, I'm so proud of you, working like that on your social adaptation! You're doing better than anyone expected."

"Did you really expect me to curl up and die at the sight of a taxi?"

"Of course not. But we worried about culture shock. The sort of thing that drove Native Americans to alcoholism, or that kills off New Guinea tribesmen."

"But they're just natives—what do you expect . . ." He could see from her expression that he was heading off on a wrong tack, and hastily changed the subject. "Can that slug you're riding run? Race you to the corner!"

"You have your nerve, Titus, when you just promised you would do no such thing!" But then she laughed and urged her horse into a fast trot. Sweeping Pinto and Miranda up along in their progress, they clattered in fine style to the end of the avenue.

That evening at bedtime, Titus reckoned up the days. He got a total of eight. Eight days of new life in the future! He felt he was beginning to get the hang of twenty-first century existence. He knew this sensation was misleading. This strange new world had its enemies as well as friends. But still a sense of triumph stole over him. He was no Miranda, forever imprisoned in the cloven pine of faulty neurology, but a polar man halfway up the glacier. Steady pulling would do it!

He lay down in the bed with its hard, high, modern mattress, and pulled the delightful sleek covers up. It was going to be difficult living here, but not impossible. In fact, he had played himself in damned well, probably better than most.

So Titus slept, and he dreamed: not of England or Antarctica, but of Syria and Lebanon. In the army, posted in Cairo, he had gone to Damascus in 1906 with the Colonel to buy polo ponies. The real-life trip had been uneventful, a jaunt to the Holy Land. But in the dream he


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wandered through the mazy alleyways of Damascus, lost. Beggars whined and clawed at his coat; and vendors in grimy robes thrust rubbish at him insisting he buy, edging too near. Horns wailed, and strange odours sweet and appalling assailed his nose. Nobody understood him when he asked his way in English, and he couldn't speak Arabic. He tried to think calmly, to find his direction. But his feet caught on baskets and matting and heaps of ordure, so that he never got himself straight. The swarthy foreign faces around him leered and twitched, alien. And the cold breath of lurking danger blew down on the back of his neck. A foolish panic seized him, that he would miss the ship to Cairo, never to return to places he knew. He began to hurry, and found himself running until he thought his heart would burst.

He woke gasping, streaming with sweat. Without thinking, he flicked the light on and sat up in bed. Just a nightmare! Roll over and think of something pleasant—that was the advice from his nursery days.

His door swung open, and an older woman he had never in his life seen before put her head in. "Hello, Titus," she chirped. "Are you all right?"

Titus clutched his covers. "Who the *hell* are you?"

"I'm Sigrid, your night duty nurse. If you—"

"And how the devil do you come to be spying on me?"

"Captain Oates, it's our job to keep an eye on you. Now, I'm just going to check your vital signs . . . "

"If you come in here, I'll—" Well, damn it, what threat could he use? These brassy female medicos hadn't the modesty to be put off by the sight of a man in his pyjamas. A male orderly he could come to blows with, but no gentleman could strike a woman. "There's nothing wrong with me," he said, resorting to snobbery with his most well-bred drawl. "I just want to sleep!"

For a moment she looked nervous. "Well, if you're sure you feel all right . . . "

"Good night." He punched his pillow with such vehemence that she retreated immediately. Titus glowered around the little room. They must have some way of watching him. Surely people who could explore the stars didn't need judas peepholes. But he couldn't imagine how a spying system would work. The walls and ceiling were white and smooth, blandly denying all complicity. Finally he clicked out the light again, taking refuge in darkness.

He had never been much for writing, but on the expedition, Titus had seen how useful a journal or record could be. With notes a man could remember, think clearly, marshal arguments. The next morning, lounging comfortably in bed after a hearty breakfast, he creased open a fresh leaf in his notebook. On the blank page he began a new list: of reasons he needed to get shot of the Time Travel Division.

Privacy and independence were paramount. Merely nagging Lash about it was a waste of breath. Action was necessary. In addition, cities were cursedly depressing places to live, too noisy and crowded. Snipers and assassins lurked too easily. And one couldn't keep a horse.

The reasons independence was impossible were so numerous that he decided not to list them, lest it become disheartening and take up too much paper. With neither money, skills nor acquaintance in this modern era, he had no assets whatever. The only people he knew were his caretakers, if one didn't count Miranda.

This last, however, he could do something about. He could get out and meet other people of this time. He didn't have to confide his end goal to Lash. Surely it was already a part of their adjustment agenda, for him to learn to operate in modern society. All he had to do was to skip ahead to that part of the programme.

And he recalled with a thrill of hope


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Shell's motherly ambition that Miranda would someday live as an independent adult—not in an institution or asylum, he gathered she meant. If little Miranda with her handicaps had that chance, a fine strapping fellow like himself was in a strong position.

A tap on the door, and Lash came fussing in, holding his perpetual small machine. "'Morning, Titus. What would you say to cognitive and psychological tests today?"

"I say to Hades with it," Titus replied. "My thought was to go over to that museum and view some more films. Perhaps that dancing doctor thing of Shell's."

Lash clutched his machine. "You didn't sleep well last night, I understand. We wanted to check on your brain function."

"My *brain* function?" They repaired my feet and fingers, Titus reminded himself. To peep at the gubbins inside my skull should be nothing. "No, I think not. I would far rather go out."

"You went out yesterday."

"What does that have to do with it? These modern sedentary ways can't be healthy. Let us walk a bit, and then view a film. Or—I know!—suppose you teach me how to drive a vehicle?"

"Surely you're jesting!" Lash's cheeks lost colour.

"I can handle a motor," Titus assured him. "My brother and I motored across France once."

"It's a very different proposition to drive a modern city automobile," Lash moaned. "I think a film would be safer!"

"Just a tick, then—let me put on some boots."

Outmaneouvered, Lash sighed. "I don't understand your hurry, Titus. You have all the time in the world. What's the rush?"

Titus looked up from double-knotting his bootlaces. "The trade secret of the polar explorer, old man. Or the sportsman. When it's time to hustle—when the blizz lets up and the Sun's shining—one moves heaven and earth, full on and the devil take the hindmost. The instant it's no longer worth while, one lies doggo and accepts fate. Never waste a scrap of energy fighting the inevitable. One has to keep a perfect balance all round, to play the game. Midway between jam-tomorrow optimism and a pessimism that would sap your spirits, for example. Or between victory and defeat—it only takes a twitch of the sledge or one false step. It's like standing on tiptoe on the top of a fence post—a man fully accepts the conditions, and defies them, all at once." He had the sense that Lash, visibly no sportsman, hadn't an earthly what he was on about. Now why had he revealed so much of himself?

The vehemence of his tone seemed to embarrass Lash too. "Carpe diem, eh?"

Titus was relieved to turn to casual matters. "Is Greek and Latin still a necessary prerequisite to get on in the world?"

"Not at all, thank heaven."

"Thank heaven indeed," Titus said. "Never been any good at classics myself." With the conversation safely planted amongst indifferent subjects, they were able to ride pleasantly down the elevator. He surveyed the plaza that separated the TTD building from the museum through the big glass windows. But what was he looking for, a Boer with a carbine? He would not recognize a modern assassin if the rotter came up and shook his hand. In frustration, he threw it in and pushed through the door.

It was another sultry city morning. Already the Sun pounded mercilessly down, and the heat reflected up off the pavement until the air was oven-hot. The vendors and pamphleteers clustered into the shady nooks and under the shelter of the several trees. And it was not even July. What kind of hole would New York be like in August? Titus hoped he wouldn't be here to see it.

He slouched with determined casualness round the plaza, trying to decide what a modern weapon might look like.


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How clean everything was! No smoke hung in the sky, and no plumes of petrol exhaust followed the vehicles. There was not a chimney on any of the gleaming glass towers, and there had been no stove, fireplace or coal hod in the TTD's kitchen area. Heating and cooking must be managed in an entirely different way. And this frightful cleanliness was not confined to the surroundings. The people too were clean, right down to their fingernails. Titus had assessed Dr. Lash as effete and delicate, but all moderns were like that. One glance at the soft bright clothing and tender uncallused hands, and it was plain that nobody here ever touched a tool heavier than a little machine.

They had strolled through the plaza almost to the museum, Lash unobtrusively steering a wide berth round all the water fountains, when Titus spied a familiar word on a placard. "'Doomster'? Is that *them?* How is it that they're still at large? Shell said the authorities would make arrests—shouldn't the entire vipers' nest be suppressed?"

Lash smiled. "This is the United States of America, Titus. Lawbreakers can be tried and convicted, but otherwise people have the right of free speech."

"Unadulterated cheek, is what it is!" Americans were mad as hatters! "But if free speech is in order—"

"Titus, no! I don't think a face-to-face confrontation can possibly result in any useful—"

Titus brushed aside his clutching hand and stormed up to the pitch, which consisted of a folding table, the usual stack of leaflets, and a white cloth banner that proclaimed in blue letters, "Time Travel Will DOOM Us All!"

His first indignant impulse was simple: to thrash the villains. He was forced to rapidly revise the strategy when he found the table manned by an older woman and what appeared to be her grandson, a pear-shaped lad of perhaps twenty. Instead, he slammed both open hands on the tabletop and fixed the woman with a masterful eye. "Well? Here I am. What do you propose to do about it?"

"Excuse me?" Rattled, the woman peered up at him from under the brim of her billed cap. Grey-haired and plump as a partridge, she had almost no shoulders, so that the line from ear to elbow was a smooth curve. She made a wildly unlikely murderer.

The youth goggled. "Ma, it's him!"

"My name is Lawrence Oates," Titus announced in ringing upper-class tones. "I don't give a rush, your wishing I was dead. But I do strongly object to sneakish and cowardly attacks! Here I am. If you think I'm superfluous, now's your moment. Do something about it in an honest way, here and now! Lash, do you have a weapon that you could lend to this lady? A knife or a pistol or some such."

"Of course not!" Dr. Lash almost gibbered with horror. "Titus, I don't think that these people can be connected with that water fountain business."

"Only at the philosophical level," the woman said weakly. "Mr. Oates—"

"Captain," Titus corrected her. Out of sight below the edge of the table he trod warningly on Lash's toe. Surely Lash could see there was no danger? Descending like Jove with a thunderbolt, he had the upper hand on these meek little prats. And damned if he wasn't going to stampede them into an apology and a promise of better behaviour!

"Our point is that tinkering with the fabric of space and time is very dangerous—and a dreadful waste of resources," she said. "Captain Oates, no one bears any personal grudge against you—"

"Nor against that poor sod who got it in the neck yesterday in my stead either, I daresay," Titus put in. "Your lot should be dashed well ashamed of yourselves!"

"We had nothing to do with that!"

Suddenly the young man spoke up. "Captain, you've had your life. You're history. You're trying to cheat fate. It



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wouldn't even be a crime to kill you—not when it says in the encyclopedia that you died in 1912. You aren't *real*."

It was the mild and commonplace way he said this that froze Titus in his tracks. He had thought of these moderns as—well, aliens, unnaturally odd. Self-assured as only an Englishman born when Victoria was queen could be, Titus had defined himself as the norm. Great God, could it be that he was the outsider after all? Tinkling like a veil of falling ice, the barriers descended, clear but impenetrable, severing him from everyone here. The boy really believed this. How could such a belief be shaken? To clout the brat and so demonstrate his undeniable reality would not convince the dozens or hundreds or thousands of others who believed likewise. This was not a physical battle, but one of the mind and heart—precisely the sort of arena Titus loathed. No sudden solution was going to be possible. This would be another damned long haul across the glacier.

His confusion was further compounded when a bystander chipped in. "That's bullshit," he said to the boy. "I mean, here the man is. You can't deny that. How much more real do you want?"

Titus turned, his first impulse to tell the newcomer to dashed well stick to his own knitting. He was horrified to see that the confrontation had gathered an attentive audience. Perhaps half a hundred people were gathered around shamelessly eavesdropping, waving black machines, and enjoying the show. Was this Yankee manners? In fact, several people were making a beeline at him, obviously hell-bent on contributing to the debate.

Lash plucked at his elbow. "Titus, the film is going to start!" Suddenly a retreat seemed eminently sensible and prudent. Unsure what to do, Titus allowed Lash to hustle him away, into the museum lobby and on into a theatre.

This was a different, smaller space from his first visit. The chamber was round, with a curved screen at the front, and rows of carpeted benches. Lash sat down heavily and blotted his wet forehead on his sleeve. "Titus, tell me the truth. There is such a thing as carrying heroic too far. You wouldn't have stood there while she took a shot at you, would you?"

"Possibly not," Titus admitted. "But the question doesn't arise. She'd never have taken me up on it."

"Thank God for that!"

"Lash, what should I do? It's as if I'm not even a human being!"

"Well, it's not as bad as that, Titus," Lash said unconvincingly. "These people are a tiny minority . . . "

"Something must be done! I could . . . could—" Nothing came to mind. How does a man assert his membership in the human race? It was a problem he had never encountered before, that possibly no one had ever faced. Sod it, he had wanted to be an explorer of unknown lands, not dangerous new social dilemmas!

There was no time to cogitate on this further. The glowing ceiling dimmed to pink. Titus shifted to a more comfortable position on the bench. Colour and light sprang to life on the curved screen. Through some magic of cinematography, the picture was very wide but not distorted in any way, so it was like looking out through a broad curve of window. Depicted was a large open indoor space, a gymnasium or barn floor. The film must be targeted towards children. Shiny-bright alphabet letters walked across the screen on tiny trousered legs, complete with shoes and socks. Every now and then the letters would break into a little dance step or jig, waving canes or hats. The phenomenon was so diverting, Titus neglected to read what the letters spelled out, and so missed the title of the film entirely. The narrator said, "We are sending people to another planet to meet the Forties! But nobody knows how they will talk. People talk with words. Suppose the


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Forties talk like this?"

A squeal of woodwinds and a rapid pulse of drums, and three of the oddest beings Titus had ever seen dashed on to the bare floor. They must be people, he decided, dressed up in striped and spangled fabric. And surely those long trailing wings were fake? They didn't look like the wings of a true flying creature. But the dancing figures were humped and oddly elongate, not humanly proportioned, and when the picture widened to show the audience, it could be seen that the dancers were at least seven or eight feet tall.

The picture shifted and slid to quickly show more than a dozen watchers standing round the edge of the dance floor. Titus recognized a few of the faces. These were the explorers who would travel across the cosmos to greet the mysterious aliens, those Forties who were so strangely generous with the secrets of travel through time and space. And there was Shell, slightly younger but entirely recognizable. Titus frowned—exploration, like medicine, was no job for women, but a week in 2045 was quite sufficient for him to learn that he was alone in this opinion.

The music whined and twittered, and the metallic drums made an earsplitting din. The humped ungainly figures writhed and bowed, bumping and jerking and flipping their wings like bugs on a hot skillet. A manic and earsplitting crescendo, and everything stopped. The three creatures flopped or leaned against each other in an unsteady pyramid in the center, exhausted. One or two of the team members clapped a bit, obviously unsure whether the show was over. Titus said, "Is it supposed to be arty, or what? Nothing would 'talk' like this."

"Nothing on earth," Lash agreed. "But hush, watch this."

The unsteady syncopated clatter started up again, and once more the three figures began to twist and twitch to the squawk of flutes. Mystifying and surely meaningless, Titus decided—"What is she doing?"

Shell was stepping out from the sidelines. She bowed to the nearest humped, winged figure, and began to dance too. She did a sort of slow skip, waving her arms above her head and circling the dance area. Another woman and a man joined her, so that it was three and three. The humans were ungraceful, inexpert but more or less rhythmic, and the humped, draped figures fluttered their wings more energetically than ever. The woodwinds and drums picked up the pace, squeaking and clattering. Titus got the sense that the dance was becoming a unit with six dancers, rather than three and three. He glimpsed Shell's flushed face as she whirled by, happy but full of concentration.

Finally the climax, and the humans were in the central huddle too, clapped by fluttery fake wings. This time the team members did applaud, enthusiastically.

With creamy enthusiasm the announcer said, "The team has been learning how to interact with strangers on their own terms." The picture split into three sections. In one, a young woman tried to imitate an elderly Asian man painting with black ink on a scroll. The center image was entirely incomprehensible to Titus: people standing in a circle, waving and wiggling their hands. In the third, a chimpanzee made faces at a zookeeper. Shell's bit was obviously over.

"I've about had enough," he whispered to Lash. Once out in the central museum area he asked, "What were those winged things? Surely they're not real Forties."

"No, nobody knows what the Forties are like, although there's been endless conjecture. PTICA made an arrangement with a dance theatre troupe, to create a communicative dance."

"Dancers? They were like nothing on Earth."



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"That was exactly the idea," Dr. Lash said. "Clever, don't you think? The Forties might not communicate the way humans do—by moving our lips or waving our hands. So the teams have been training to think broadly—to recognize meaning in as many forms as possible."

Dancing seemed to Titus an asinine way to communicate, but he felt disinclined to argue. The museum, unusually crowded today, was beginning to give him jip. "Let's get out of this. Is there nowhere in America where there's room to breathe?"

"That would be too much to ask for in New York. But come this way."

It came to Titus that the Forties were not the first aliens Shell was going to meet. A gap of a hundred and thirty-some years was as good as light-years. He too was dancing, frantically trying to convey meaning to bewildered watchers. Reflecting on this and following Lash, he became aware they were walking along a narrow corridor, quite empty, somewhere in the back premises of the museum. Lash was talking energetically, and once again he hadn't been attending. Luckily, as he paid heed to the words, Lash was talking to his machine, which replied in a metallic little voice.

"—supposed to be carefully orchestrated," the machine complained bitterly. "Tantrums in the kook plaza and suicide by little old lady? This is not what I had in mind for the media debut of our star time traveler."

"I couldn't stop him, Rick," Lash said. "And the current hullabaloo is surely nobody's fault but the Doomsters."

"The newsies are fanning the flames," Rick said. "With any luck, the yahoos'll come out with egg on their faces. In the meantime, keep him out of view! Can you get back to the TTD all right?"

"I know these skyways like the back of my hand," Lash boasted.

"And the minute there's trouble, yell," Rick instructed in his tiny machine voice.

"Of course, of course."

As Lash clipped his little machine back onto his belt, Titus demanded, "What is all this about? Why are we going this way?"

"Well, I'm afraid it wouldn't be prudent for us to go back through the plaza at this moment. Your, ah, righteous indignation seems to have fueled vigorous debate. And someone had a feed to the newsies going, so it's all over the information network. Up this way—maybe we can get a view."

He led the way through another door. Now that he knew what to look for, Titus saw that Lash was unlocking the doors as he went by passing his wrist over a tiny screen. Carefully Titus kept his hands in his pockets. No more experimenting with chips for him!

Up the stairs and around several more corners, and they emerged into a more public passageway. A few people strode in a businesslike way down a glassy corridor. Titus walked more and more slowly. "Lash, this is amazing."

"What? Oh, sorry, Titus. Take as much time as you like. The longer we dawdle, the better."

The corridor was a bridge, crossing from one building to another right over a busy city street. Midway across, Titus stopped and looked down its length. Glass buildings towered and crowds teemed as far as he could see. It was like looking down a colossal river canyon, only this one was forged by man. It was obviously impossible to walk out of the metropolis. Only the living green heart at the center of the city kept it from calcifying into solid pavement. Wonder and envy filled him again, at the power and glory of it. Some of those buildings must be a hundred stories high. These Yanks!

"And if we step around the corner and up here, to this next skyway . . . "

"By Jove. Is that smoke?"

"Riot gas. It *has* gotten ugly, oh dear. Rick, are you getting this?"

"O' course," Rick replied from the little machine. "You shoulda seen it ten minutes ago when the nightsticks made


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their sweep."

Titus stared in horror and delight at the plaza below. From this vantage point he could see most of the area. Tables had been kicked over, and fallen placards and leaflets swept by the sultry breeze into untidy drifts. A few angry people were scuffling with blue-clad police, while others swarmed over the planter boxes and garden walls, tussling with each other. Official vehicles were parked at the kerb, so many that their blinking yellow and red lights seemed to pave the roadway. "What's it all *about?*"

"I'm afraid it's probably you, Titus," Lash said.

"But why? What is there to fight about?"

"You could call it democracy in action, I suppose. The time-travel project is tied into the entire Fortie project, which has been undeniably expensive. Probably it hasn't escaped your attention that the TTD end of things runs on a shoestring."

In fact, it had escaped Titus's notice rather—his attention had been occupied of late. But now he came to consider it, the time-travel business did not seem to be run in quite a silk-lined fashion. For whose convenience was it that he was housed in a spare room in the TTD office building? Under Lash's sole supervision, was not his acclimatization process something of a hodgepodge? His journey to the future was a minor corner of the much larger Fortie project, of course. But it had not occurred to him that this would be reflected at so basic a level as funding. His conscience smote him now as he remembered the expensive riding boots. "Money is always the sticking point in exploration," he said. "The most irritating part of the business by a long chalk."

"It makes sense," Lash assured him. "Building a starship is stupendously expensive. The problem being debated down there isn't the balance between the TTD and PTICA. It's the balance between PTICA and every other expenditure the world government has to make. And there's no true solution or end to it. I knew those two at the table must have had backup—we left in the nick of time. We haven't had a shindy here in so long, I'd hoped they'd gone out of style. Let's move along this way. Hi, Shell. Oh, he's fine, I have him right here. Yes, tell Sabrina . . . "

They went down stairs and across another skyway or two, debouching at last into the lobby of another building. "Two blocks uptown and we're home," Lash said, pointing.

Titus had lost his bearings long ago. "I'll never sort out this rat's maze."

"That's what I'm here for, Titus. Now this bit we want to do smartly, because the newsies are still about. Right this way . . . "

Outside was hotter than ever, a sensation made worse by the astounding number of people. The pavements were wide enough, yet crammed. Titus shouldered awkwardly past other pedestrians. They battled through to the corner, where a tidal wave of pedestrian traffic surged across as the traffic light changed. Titus took his eyes off Lash for no more than an instant. But it took only that flicker of time for the other man to vanish into the maelstrom of humanity. Suddenly Titus was alone, lost in an utterly alien city, buffeted by malevolent strangers. The terror of the nightmare seemed to squeeze the heart in his chest.

But this was waking life, no dream. He kept his head, breathing slowly to quell the irrational panic. It was only a block or two to the TTD building, and they had been heading towards it. If he pressed on in the same direction, it should be only a minute's walk. Still it seemed to take all the sand he possessed to continue forward. It came to him that Lash had been right the other day—what he was attempting was a feat, a stupendous jump that might not even be achievable. Well, damn it, if anyone could do it, he was the man. I've bloody



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well sledged to the South Pole, he reminded himself. An urban block, however far in the future, is a fleabite compared to that.

Slowly, he walked one block. None of the buildings were familiar. He crossed the street with the lemming-tide of other pedestrians, and went another block. It seemed very long. Hell's bells, there was no denying it: he was lost. But he could backtrack and make another cast. Not until all other possibilities were exhausted and starvation imminent would he ask a passerby for help. It would be unmanly, and perhaps dangerous to boot—what if he petitioned a Doomster?

At this second corner he halted again. The living and eternal roar of the city surged in his ears like the thunder of surf. There must be some signage or marking or direction here, indicating the name of the streets. But the lamp-posts were hung with signs, billboards, posters and hoardings, and he couldn't pick out the information he needed. Typical Yank mismanagement, but in justice he remembered that London had been little better. Probably it had been the same in Nineveh and Tyre—cities had been the devil since the dawn of civilization.

"Captain Oates? Captain Lawrence Oates?"

He started and turned. The sight of a complete stranger bandying his name about made him scowl. But no! He was going to broaden his circle of acquaintance. And sure enough, the tall young man introduced himself: "I'm Talbot Graham, Captain, with the InterCyber News Service. And am I correct? You're Captain Titus Oates?"

"I am. And what is the InterCyber—a newspaper?"

The young man smiled. "Yes, you could put it like that. Only it's online and vid as well as text, which makes us a newsie." He jerked his head at an assistant who seemed to be wearing rather more than the usual number of little machines. "I would love a few words with you, Captain, if you wouldn't mind. I can't believe my luck, running into you on the street like this! The first live-vid appearance of the heroic time traveler!"

A soldierly instinct had prompted Titus to get his back to the lamp-post at the corner. Bolstered by that security, he now called to mind how newsies were nearly instantaneous. A few moments of chat with this fellow would draw Lash here as sure as the Moon pulled the tide—far preferable to begging passers-by for help! Titus assessed this Graham with new interest. Not military material—modern men were lamentably hollow-chested and willowy in build. And Titus had to make an effort not to gape at his clothing. Floppy yellow knee pants must be the latest mode. Titus silently vowed he would be hanged before anyone made such a guy of him. But otherwise Graham seemed harmless enough; positively panting to please, in fact. "I daresay it would do no harm," Titus said. "But I don't much care for just answering questions. Turn about is fair play, wouldn't you say?"

"Of course! I would be eternally grateful, Captain. Just five minutes of your time, no more! We've heard so much about PTICA's forays into time and space, and excitement about your arrival has been so high! May I say that you look wonderful? The restoration team has worked miracles!"

"Thank you." Unnervingly, the presence of Graham and his assistant drew attention the way that Titus alone had not. A crowd had rapidly assembled behind the assistant, clogging the pavement and staring in happy fascination. The unpleasant animal-in-a-zoo sensation made his blood rise. "My turn. This conversation: shall it be written up and printed in a newspaper?"

"Not at all! We're linked, and this is a live InterCyber broadcast!" This seemed to be a cue, because the bystanders grinned and waved in the most inane fashion. "So you've been seeing the


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sights! Tell me, Captain, how do you feel about the twenty-first century?"

"It's an era of wonders," Titus said truthfully. The rustle of approval encouraged him to expand. "You've all done marvelously well. Everywhere I turn, there's something nobody could ever have imagined in 1912."

Graham smiled. "I envy you, seeing all the glories of our age for the first time! We're looking forward to hearing all about your adjustment to the modern era. Perhaps you'll write your memoirs?"

Titus hid his disgust. "One never knows."

"And your opinion of the Fortie phenomenon? What do you think the residents of Tau Ceti will be like?"

"You want my genuine opinion? In my humble estimation, you Yanks are far too trusting a lot."

"Trusting?"

"Absolutely. To plunge into the unknown counting on a benign reception is folly. Think about what's-his-name, visiting the Japanese for the first time."

"Perry," Graham said helpfully. "Commodore Matthew Perry."

"Quite so. Now there was a man who had the right pig by the ear," Titus said, warming to his theme. "Steam in and make cordial noises if you like, but run the guns out and have the hands standing by. If you begin from a position of strength, you get respect. We saw the same thing in the Boer War."

"Then you don't feel that any space-faring intelligence is likely to be benign?"

"I can't think of an historical one, can you?" Titus demanded. "It gave me a chill, to see the contact teams practicing dance, of all the damned nonsensical claptrap! Small-arms practice would be far more useful." It was plain as paint that the concept of fair turns and good sportsmanship had not struck any chord in this puppy, so Titus quickly threw in his question: "It gave me the vertical breeze, to find that there are people who don't approve of time travel. Is that a prevailing sentiment?"

"Well, let's consult the man in the street! Hi, miss—would you like to meet a real live time traveler? What's your name? Captain Oates, this is Suze Santangelo from the Bronx!"

Titus stared appalled at the scantily clad young female Graham plucked out of the crowd. The brazen woman stood far too close to him and gushed in an utterly unladylike fashion: "Don't listen to those parabs, Titus—or do I call you Lawrence? Those poovs, they're absolutely un-mist. I think you're just the noon! Could you give me your autograph?"

What the devil was she saying? If only Lash would turn up and translate! Titus stared dumbly at the creature as the unspeakable Graham produced what might have been a writing implement. "What do you want him to sign?" Graham asked her.

Beaming from ear to ear, she lifted the front of her already-too-short blouse, revealing a slice of plump brown midsection. "Would you sign it too? Please?"

Graham laughed heartily. "Sure, sweet cheeks! How about right here, beside your belly button?" He signed his name with a flourish and held the pen out to Titus.

Shocked beyond words, Titus realized that he had run full-tilt into an impossible cul-de-sac. Was this really happening? The entire situation had suddenly metamorphosed into unreality. He was surrounded by aliens. Half a dozen contradictory options rushed into his head: flinging the vile futuristic pen into Graham's teeth; bellowing at this hussy to cover up like a decent female; pelting down the street foaming at the mouth; curling up into a ball right here on the pavement until the Sun set and everyone went away. But it wasn't allowable to show a loss of composure before inferiors—it went without saying these were inferiors. The desire to connect crashed head-on into aloofness, the instinctive contempt of the British gentle-



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man for mere natives. Suddenly the solid metal lamp-post at his back was no refuge, but a trap, and his mouth was dry as sand. Hardly knowing what he was doing, he stepped sideways.

He had forgotten the kerb. His foot came down wrong and he tipped backwards into the street, flat onto his back like an overset doll. A tremendous cacophony roared over him, filling his ears: horns, shouts, squeals, and a sustained shattering crash of metal and glass. Stunned, he let it wash over him. But it was for only a second. Hands seized him, dragging him up and away to safety. He looked back—a long silvery omnibus had veered sharply to avoid him, and crashed into the taxi beside it. Even as he watched, another motor smashed into it from behind. The omnibus heeled over majestically, like a beached whale washing onto shore, and the muffled shrieks of the passengers inside could be heard.

People and faces boiled past, buffeting and clutching and calling out advice, as he staggered for footing. When a familiar one whirled past, he lunged, seizing it. Thank the Lord, here was Lash at last! He could only express his relief in blasphemy.

Lash panted, "This way, quick. I have a taxi for us around the corner."

Titus tumbled in. "Where did you get to?" Lash almost wailed, slamming the door behind them.

"I might bloody well ask you the same thing!"

"And a newsie, of all the people to talk to! If we can get back to the TTD fast enough, and Rick can get on top of it—"

The taxi ride was very short—Titus had been within half a block of his destination all the while. He was too exhausted to castigate himself. All he wanted now was to hole up and lie doggo for awhile.

He woke in his own room just where he had fallen on top of the covers. Someone had drawn the curtains, but a finger of sunshine crept between, so it couldn't be late. His chin was still smooth and his stomach rumbled with hunger. It appeared he'd only napped for an hour or so. It was astonishing how a little rest could revive the courage. Nonetheless, Titus felt no urge to go out any more today. Time for a little peaceable domestic exploration, perhaps.

He wandered down the hall, peering into doorways. An office with nobody in it; Dr. Trask's surgery—no, he remembered now that Americans called it an examination room; a windowless meeting room furnished with a large table and a dozen chairs; a larger office with several people at desks working on little machines.

He emerged in the common area. Ensconced at the long table, Shell was eating from a tray, clicking buttons on the perpetual small machine, and talking to it. He prowled the room quietly so as not to disturb her.

He could identify none of the machines or devices in the kitchen area, recognizable only because there was a washbasin piled with dirty dishes. He didn't even know how to work the taps. He realized now that his own bathroom had been specially fitted with antique fixtures that he could use without thought. Possibly Lash was the man to thank for that bit of thoughtfulness.

A machine in the cabinetry above the counter seemed to be a coffee dispenser—he could see the coffee inside a built-in flask, and when he touched the glassy vessel it was warm. This would account for Shell and Dr. Trask's appalling ignorance about tea. The cat-lap he got must be specially procured for him by someone who knew nothing about it—no wonder it was so foul. When in Rome and all that—he had no objections to coffee. But getting this coffee out into a cup baffled him. The flask didn't slide out, nor was there a spout or hose, so how did the damn thing work? Damned if a seething machine was go-


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ing to foil him! By chance more than intent, he found that the flask slid out of its niche for pouring if one grasped and turned it by its curved black handle. This minor victory bucked him so much that he hardly cared that he couldn't get the lid off the flask, or that the cups were immured in a glass-fronted cupboard that defied him. He carried the flask over to Shell, who absently took it and topped off her own mug, thus revealing that the thing worked like teapots—one didn't have to take off the lid to pour.

All he needed now was a cup, and were there not plenty of used ones in the sink? He chose one and nearly jumped out of his skin when the water turned on of its own accord, arching from the sleek metal tap onto the dishes below. Not to look a gift horse in the mouth, he hastened to rinse the cup and pour himself some coffee. The water turned itself off again, too. Apparently the sink could tell when a person wanted to wash up. Perhaps it was keyed to the chip? Charmed, he played with the device, waving his hand above the tap in the manner of a stage magician to make the water appear. "Abracadabra, eh?" he said to Lash, as he came bursting in.

"Hallo, Titus—glad you're finding your way around. Shell, we're having an emergency meeting—you'd better sit in."

Shell gave him a nod, and spoke to her machine. "Look, Bel, I have to run. I'll call you later, all right? Give Pats a kiss for me." She scooped up the tray and pushed the entire thing into a slot in the wall before hurrying out after Lash.

It occurred to Titus that Lash's emergency might have something to do with the tumultuous events of this morning. Suddenly uneasy, he followed, cup in hand. If they had gone to another floor in the building he would never find them, but to nose round on this level should be simple enough. And indeed, people were assembling in the meeting room down the hall, Lash and Shell among them, to watch half a dozen screens let into one wall. Titus slipped in, and Lash pulled out a chair for him.

By jingo, that was himself on a screen! Talking to that Talbot jackanapes! They were, yes, on the crowded street corner being ogled by interested throngs. He always looked a fool in photographs, either laughing or scowling at the camera, but there was a weird fascination now in seeing himself in motion. From the angle, Talbot's assistant must have been filming him all that time. Doubtless one of his little machines had been a cinecamera. He had not realized that cameras could be got so small.

"Titus, how could you?" Shell fixed him with an ominous look. "Spouting off to that little vid weasel!"

"I didn't take him seriously," Titus had to admit. "You can't tell me that a man who goes about in yellow knee pants is a person of consideration."

Dr. Piotr, the pinkly plump head of the Time Travel Division, snorted with laughter. "He's got you there!"

Titus tasted his coffee. It was dreadful, worse even than the tea. Perhaps sugar and milk would improve it? There were paper sugar packets and little sealed pots of milk on the side table. He added both lavishly until the brew was palatable.

And here he was on another screen again! Rick had mentioned that someone in the crowd had been filming in the plaza. Perhaps one of those elfin cameras was the way they were keeping an eye on him in his room? This time he looked a frightful bully, pounding a table beneath a white and blue banner while ladies and boys cowered. A shocking exhibition of foul temper and poor manners! He stepped up to face the music immediately. "Inexcusable behavior on my part," he apologized.

Shell grinned at him. "This is the self-deprecatory British bit, isn't it?"

"It's absolutely perfect," Piotr said. "Offering to let them finish the job on


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you? Titus, you're a living wonder. Thrilling's the only word for it."

"Or insane." Lash shivered at the memory. "You wouldn't say it was thrilling if you'd been standing there beside him."

Titus could only shake his head. By what standard were his one set of actions considered admirable, and the other not? He watched, trying to sift the problem out.

"Damn," someone watching the screen said. "Latimer is asking questions on the Senate floor again."

Groans. "Just what we need!" "Why didn't the good people of Iowa put a sock in him?"

"I thought we'd dug a hole for this issue and buried it," Shell said. "Until you, Titus, went and dug up the body!"

"Me? Are you on about the dancing? You were very graceful, Shell, but it's balderdash to believe that any native would be impressed." An unmistakable undercurrent of dismay from the group made Titus add, "Curse it, should I not say 'native'?"

Dr. Piotr made an exasperated noise. "There's no time to explain now, Titus. Just keep away from vid crews!"

"No one will take note of a clown like that," Titus said, nodding with contempt at his image on the screens. His glassy expression as he confronted the brazen woman lifting her blouse would have made a cat laugh. And this inane image was doubtless being shown on screens all over the country, perhaps the world. "I'll be a figure of fun for the rest of my life."

"Tasteless but funny—the typical on-the-street newsie," Dr. Trask said.

"I think you'll be surprised and pleased, old man," Lash said soothingly. "You can see that you don't lack for rescuers."

"True enough," Titus had to concede. His backwards tumble into the street was the stuff of music-hall farce. But the choruslike wail of dismay from the watching crowd was undeniably a spontaneous expression. Obviously the bulk of the populace did not regard him as superfluous. And the stupendous traffic tie-up was triggered by the impulsive surge of Good Samaritans into the street as much as by the toppled omnibus. He could hardly make out his fallen figure in the rush of helpers bearing him to safety, and the hapless Graham was nearly trampled in the stampede.

"If only you'd kept your mouth shut about the Forties!" Dr. Piotr shook his head. "Christ, it would've been perfect."

"It would've been all right if you'd laughed at his pants," Lash explained. "Or criticized the food, or the climate. But you have to realize that you're tied in with the project, Titus. We brought you here, and you've captured the public imagination. And when you touch on a hot issue like the Forties—"

Titus snarled with frustration. "I don't understand where they got the idea that *I* know anything about it! Who cares what an antique soldier like me thinks? I can't even open the kitchen cupboards!"

"Oh, you poor thing," Shell said, immediately sympathetic. "Was that what you were fussing around the kitchen for? You should've asked—" Her machine beeped, and she said to it, "What? Oh, hi, Rick. Yes, I saw Graham. Sure I'll make a statement. Well, you could send me a draft."

"Have I really dropped a clanger?" Titus said dismally.

"Not to worry, Titus," Lash said, without a scintilla of conviction. "You have to grasp how public affairs work in this era. There's always vigorous contention between various projects for scarce resources. The Fortie project had fine innings for a number of years, but there's always a faction insisting that the money would be better spent on feeding the poor, or restoring the Everglades, or some such. Debate is healthy, a part of the democratic process . . . "

Titus stopped listening. The modern era was like an onion: layer upon layer


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of complexity. His travel through time had only been a sideshow, a test of the Fortie drive that would take humanity to the stars. And beneath the high-minded fuss about revising the world was the money trouble. It still baffled him that anyone would solicit his opinion about anything, but if they regarded it so highly, so be it. "Let me go back to that young whelp, and put him straight."

The cries of horror that greeted this proposal quenched his enthusiasm. "They'd eat you alive, Titus," Dr. Piotr said. "Haven't we already seen that?"

Still clutching her little machine, Shell said, "Rick says they'd all love to see him. He's telling them no—wait a second, Rick, and I'll get you up. And they aren't buying it."

"A medical reason," Dr. Trask said. "I can cook up a medical excuse for him to be unavailable."

The glint in her bright blue eyes gave Titus a qualm. "I feel fine, truly!"

"No, you don't, Titus," Shell contradicted. "You feel dreadfully ill."

She was fidgeting with her machine, and suddenly a new voice squawked from it. It was Rick again, saying, "That sounds damned smart, Shell. Let's pursue it. What's wrong with him, Sabrina?"

"He's sick as a dog," she said promptly. "Needs quiet, not to be bothered by newsies and worried about Doomsters gunning for him."

"Quiet is damned attractive," Titus said, remembering his list. "If it doesn't smack of the white feather, I'd like to get out of this city."

"Did you hear that, Rick? Excellent idea, Titus."

"Chronal displacement syndrome," Dr. Trask said, shaking her head gloomily. "Very serious. We've been worrying and preparing for it for months. Let me feel your pulse, Titus. Tch! Terrible. No, the only hope is to recoup his strength somewhere far away."

"At this point, PTICA will be much more comfortable if he's stashed in a safe place," Dr. Piotr said. "My only stipulation is that somebody keep him under supervision." Titus growled at this, but Piotr pointed out, "Titus, today you incited a riot, and kicked off a traffic tie-up that'll keep the Upper West Side gridlocked till midnight—and that was just before lunch. You're too hot to let out alone."

Lash added, "And by the time Titus has had more time to adjust, all this Doomster nonsense will have died down."

Rick's voice rang from Shell's machine on the table. "So where could we park him that would be quiet—and cheap? Titus? Give me your take. If you could hoop anywhere in the world for a couple months, where would you like to lay it?"

"How about England?" Lash suggested.

"Not with a barge pole!" There was little left for Titus in England now but memories he hadn't yet the strength to face. The idea of seeing how terribly his country had altered in the past 133 years made him quail.

Rick said, "Bad move, Lash. The conquering hero returns home in triumph, and the media is over it like white on rice: parades, presentations, the works. Antarctica is more secluded. What do you say to returning to the old territory, Titus? The National Geographic Society is planning a special on the old explorers, and they'd like you to do color commentary. How about some video of you walking in the snow on the old route, standing like a hero at your own monument, huh?"

Without thinking, Titus exclaimed, "I'd sooner be shot!" Somehow this was even worse than the idea of returning to England.

To his annoyance, Lash noticed his distress. "He's not ready for that, Rick. It's much too soon. Give him time."

"Antarctica is too exciting," Piotr said. "We want someplace boring. Where nobody goes and nothing happens. And I have just the thing. My family leases a


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beach house on St. Simon's Island, in a gated community down the Georgia coast. Private, exclusive, and relaxing."

"What does one do at a beach?"

Dr. Piotr sparkled with enthusiasm. "Lie on the sand, swim in the ocean, drink blender cocktails, surf-cast. And there are four gorgeous golf courses. The back nine at the Hampton Club takes you right through the wetlands—miss the green and your ball is gone forever, eaten by alligators."

"It sounds charming," Titus said, unenthused. He had tried golf in England, and found it deucedly tame.

"Well, how about something with more flavor?" Dr. Trask proposed. "I don't want to risk my patient with alligators. Shell, you met my brother, Howard."

"The one who married the history professor," Shell said. "Sure."

"Well, she converted him—or he converted himself, I don't know which—and now they're living in this strict Orthodox community on Long Island. It's about eight square city blocks, and they have a real job for somebody like Titus."

"A job!" Titus sat up, electrified.

"Are you sure, Sabrina?" Lash said. "He has so few qualifications for employment."

"For the Shabbos, Kev," Dr. Trask said. "That's the beauty of it. He doesn't need any qualifications except being a Gentile. And he'd only need to work on Saturdays."

Shell clapped a hand to her head in exaggerated amazement. "It's so high-concept, Sabrina. You shouldn't be wasting your talents in clonal surgery. You should be in Hollywood writing sitcoms. Edwardian time traveler as a Shabbos goy—I'm going to bust a gut."

"Exactly," Dr. Trask said modestly. "Nobody would look for him there—it's just too wacky. And he'd be close enough to the TTD to come in and get checked over every now and then, which is what I'm interested in."

With a feeling that events were entirely running away with him, Titus demanded, "What is a Shabbos?"

Shell said, "Titus, it's important that you understand: Sabrina is suggesting that you hole up in a community of very conservative Orthodox Jews. You would do odd jobs for them once a week on the Shabbos, the Jewish day of rest, when they're forbidden to work."

Titus frowned, thinking hard. "You mean live in a Jewish ghetto. Is that the right word?" he added, suddenly uneasy.

Nobody replied, sure sign that he had somehow dropped a brick once more. Lash said to Dr. Trask, "Isn't your sister-in-law that Holocaust scholar?"

"Yes. You probably saw her book—the one about the concentration camp at Buchenwald."

"'Concentration camp'—that's British," Titus said. "Coined during the Boer War, if it's the same term."

"I don't think there's time to explain, Titus," Shell said, adding to the others, "Maybe Titus would increase the stress in the household more than they would like."

"Miriam does like to argue," Dr. Trask sighed.

Rick's voice boomed out from the speaker: "Oh, for God's sake. How about this: my aunt and uncle raise soybeans in Ohio. A nice visit to the farm—what do you think, Titus?"

"Would I get to do any farm work?"

"You wouldn't have to do a thing, pal. It's all automated. Aunt Claudia does some hand-spinning from her angora bunnies. You could help hold the skeins of yarn."

The ghastly prospect of months helping an old lady wind fluffy wool forced Titus to be frank. "You don't understand. I don't want to lounge about on perpetual holiday. I want to do things, contribute. To have no role, no job to do in the world—it's hellishly depressing."

The listeners he could see seemed sympathetic, but from the machine Rick said, "Problem is, you aren't very marketable, Titus. None of your skills trans-


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fer over from the nineteenth century to the twenty-first."

"It's not your fault," Lash said earnestly.

"But it's true." Titus held his head in his hands and tried to keep the bitterness out of his voice. "How can even *farming* be beyond my skill?"

"It was the default career in your day," Rick said, "but times have changed."

"I hadn't really planned to do this." Shell sighed and leaned both plump elbows on the table. "But I suppose you could come out to Wyoming with Miranda and me."

"Wyoming?" For a moment Titus couldn't recall what Wyoming was. "Where there's room to gallop horses!"

"Shell, you're a softy," Rick said. "Isn't that slot allotted for your family?"

"Yeah, yeah," Shell said. "But he really does get on well with Miranda. He has the right attitude. I know from the books," she added to Titus, "that you haven't had much exposure to handicapped children. So it beats me, how you can talk to her so well."

Miranda and I are fighting the same sort of battle, he would have said. But this might be misunderstood.

"But, but it's dangerous out there," Lash said, staring at his little machine. "Look at this list of liability waivers! Titus, are you aware of what they do for a living? And you'll have to deal with the public!"

"You make it sound like prostitution," Dr. Trask said. "What it really is, Titus, is a sort of living history thing. Nat and Mag dress up in historical clothes, and take tourists for rides in covered wagons."

"Usually four or five-day camping trips," Shell amplified. "They can always use another wrangler. You live rough, there's no denying it. But you're used to that."

"Certainly. And I take it these wagons are drawn by horses? I can help with them."

Dr. Trask whistled. "Wow! Can you drive, as well as ride?"

Titus looked at her open-mouthed. "It was as necessary in my time as driving a motor must be for you."

Lash said, "But—there are rattlesnakes! Lightning strikes! Heat stroke! Grass fires! Falling rocks!"

"Better and better." Titus rubbed his hands in anticipation.

"Aren't you a pistol," Dr. Trask said. "But you are not going to fall off a rock, Titus. For my sake."

"They only list those things for insurance purposes," Shell said.

"But you'll keep a close eye on him," Lash pleaded.

"And who is Mag?"

"Owner and manager of Prairie Schooner Tours."

Owning and managing a business was not a task adapted to the fragile female mind—but Titus held his tongue. Lash said, "Will they mind if you turn up with an extra passenger?"

"I'm not going to be a passenger," Titus said.

"That's right, he's going to work," Shell said. "Although possibly not for a wage—I'll discuss it with Mag. But if you're fed and not paid, I don't see how she could beef."

"These are minor details," Rick said. "It sounds excellent from this end. Ain't nobody going to look for an Englishman in the grasslands of Wyoming. That's better even than Ohio. I'll start leaking rumors immediately, that Titus is going back to South Africa or something."

"So it's settled," Piotr said. "Shell will open discussions with the tour people, and Kev will help Titus pack."

"A *few* clothes," Shell advised. "You'll have to dress right, Titus—Mag will take care of that."

"Right, as in how?" Titus demanded, suspicious. "I won't wear baggy knee pants."

"To fit in with the period," Lash said. "What is it supposed to be, Shell, the late 1800s sometime?"

"*Little House on the Prairie* country,"



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Shell agreed.

"My God," Titus said. "Do you realize what this means? For once I'm going to be too modern!"

He had not intended to be witty, but when everyone laughed and applauded, he couldn't help grinning too.

Ever conscientious, Dr. Lash amassed a cart full of books and films about prairies and the American West a century and a half ago. It weighed on Titus that he felt no interest in these materials. Behind the stoic façade, he fretted like a kenneled hound. If they didn't get away, he'd murder someone, or take to drink! "Suppose you make a list, Titus," Lash coaxed. "Of what you think you might like to bring on a camping trip."

"The tour people have clothes for me."

"Of course, but you'll want more than clothing, won't you? Your riding boots, for instance."

Titus considered. "You mentioned snakes, I believe. I ought to bring a pistol. It'd come in handy for Doomsters, too."

"But Titus! You have no license for one."

"License? People need a license here to own a firearm?" Titus could scarcely imagine such a lunatic practice.

"It's necessary, Titus. Guns can be dangerous."

"That's the whole ruddy point of firearms! Do you regulate kitchen knives and forks, too?"

"No—but you need a license to drive a car or a motorcycle. Also to own a dog, a dangerous reptile, hold a tag sale, or light an open fire." Titus was unable to keep his mouth from dropping open at this recitation. Lash went on with a touch of impatience, "This is a major metropolis, Titus. You can't just wander around doing anything that seizes your fancy."

Dear God, what a society! "My life is in danger," he argued. "I need a weapon for self-defence!"

"That's the last thing you need, believe me. Nobody is going to assault you in person."

"Cowards. I wish they would! It's the principle of the thing. Do you realize how different the final polar journey would have been, if only I'd had the sense to bring a pistol along?"

Lash's cheeks turned pallid. "Titus, these wagon tours are nothing but tourist jaunts, I assure you. Desperate measures will never be necessary. We would never put you into a position where your life was in peril. And recall, Shell will be bringing Miranda—she would never endanger the child!"

Silently, Titus cursed his own stupidity. Perhaps out in the West attitudes would be more relaxed. He turned the subject: "It's a jolly long way to travel. Shall I go by train, or what?"

"Would you prefer that? Or would you care to try traveling by air?"

"Flying, you mean?" The mere idea made his heart leap. "An absolutely ripping idea! I should enjoy that tremendously. In my time, commercial flight was no more than a dream. Shall I have to take aeroplane lessons?"

"No, no! We'll just be passengers. It takes extensive training to become a pilot, and you also have to earn a—"

"A license," Titus finished for him. This was the tamest, most milk-and-water society he could imagine. No smoking, no booze, no guns—surely the entire twenty-first century could not be equally bloodless? If it was, he might as well cut his throat at once before he perished of galloping ennui. Even those thrice-damned Doomsters had let him down, lying low instead of taking another shot at him.

He could have shouted for joy when the departure day finally came. It was so early the Sun had not quite risen, and the narrow stripe of sky visible between the glass city towers was colorless. His meagre dunnage easily packed into a small sausage-shaped case. Titus tossed it into the front seat of the taxi, reflect-


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ing with pleasure on how natural modern motoring came now. At the back, Lash struggled with a huge orange sack-like suitcase that sagged as he tried to heave it into the boot. Titus fixed a commanding eye on the taxi driver, who was idling near the front of the vehicle. "You! Look nippy with the bag!" It was gratifying when the driver leaped to obey.

"I hope Shell will meet us all right," Lash said when they were safely on their way.

Titus fastened his seat belt. "At the terminal, or dock, or whatever it is?"

"Airport. It's always challenging to travel with Miranda."

"I'd wondered why you've come for the ride—so she wouldn't be burdened with two deadweights."

"Not at all, Titus—you're no trouble! But until you're familiar with public places a little more, it's better to have another man as a companion, wouldn't you agree? It took you some moments to master the kitchen faucet. If during the course of the journey you were to feel the, ah, call of nature, you could not ask Shell or Miranda to—"

"Too right," Titus said, much struck. "Admirable forethought! That aspect never occurred to me."

Lash smiled. "Well, it's my allotted task, after all."

The taxi was speeding like fun over a high long bridge. The tremendous arching structure soared carelessly above the river below, carrying the taxi on its long smooth spine. It was better than the elephants in India, better than a motorcycle. On the other side of the water the city spread and spread. The metropolis seemed as limitless and inexhaustible as the ocean. Even the airport was enfolded within it, a place of smooth concrete pathways for winged vehicles. Titus pressed his nose to the glass to get a glimpse of them.

The Sun was on the point of rising, the eastern sky washed with primrose light. And there, high up, was a sight that made a shiver of awe trail down Titus's spine: a new star! No, not merely a star, a constellation, a close complex grouping of celestial bodies moving slowly across the heavens. For a moment he was gobstruck, with the dumbfounded wonder that aborigines felt when presented with a telephone. The moderns meddle with the stars, he reminded himself, gulping. They've talked to the unknowable beings who live there. "Lash, what stars are those? The bright ones."

"Aren't they pretty? Like jewels. It's the Space Station, and three or four of its support vehicles and shuttles. When you're in luck, you can see a smaller light moving away from the cluster—that'd be either an orbital shuttle or an earthbound vehicle on its rounds." Lash spoke with pride, but no excitement. To him this was commonplace!

The taxi disgorged them in front of an enormous low building. Lash flung first his bag and then Titus's into a kerbside chute. Titus decided not to ask why they could not carry their own luggage onto the plane. Instead, he followed Lash through the big glass doors.

Inside was thronged. Was there nowhere in America where one could experience solitude? Obedient to Piotr's orders, Lash kept one hand on Titus's elbow through the crowded wide corridors and interlocking glassed-in lounges. Titus immediately lost his bearings. The familiar sense of overload was beginning to steal over him when they halted at a high desk, one of many they had passed.

Titus stood well back as Lash slid his left hand underneath what looked like a large kitchen tap. A ticket popped out from a console underneath. "Not I," he declared. "Suppose it's rigged again?"

"Never in an airport, Titus. That would be a federal crime." Lash repeated the action, extracting a second ticket, and guided him to a nearby seating area.

"It's less of a crime to kill me out in the street?"

"Well, yes—the draconian penalties


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for interfering with air travel date back to the beginning of this century. The history of the combat against air piracy and terrorism would fascinate you, Titus, the way it's driven the development of wrist chips and universal ID—"

"Some other day, perhaps," Titus said hastily. This sensation of being tracked by a hidden foe was intolerable. He was a hunter, not the prey! And how odd, that air terminals were something of a sanctuary. The only analogue that came to mind was fox hunting, where one could not shoot a fox—an arbitrary rule, but immutable as the laws of the Medes and the Persians. "How shall we find Shell in all this huggermugger?"

"She's meeting us here," Lash said. "Sit down and keep an eye out for her, will you? I'm just going to check the status of our flight." He took out his little machine.

Titus felt sure that gaping at the view marked him as a hayseed. But he couldn't resist. The window extended from floor to ceiling, giving a fine view of the endless concrete pavement outside. The silvery vehicle passing seemed large as a whale and about the same shape. Only when it turned did he see the sleek triangular profile, swept back into broad wings as wide as the vehicle was long. Not a whale: a manta ray, perhaps. The windows were tiny, mere freckles set into the flanks of the thing, and inside he glimpsed faces. Then size fell into perspective. It was huge, bigger than an ocean liner. Impossible to believe that so enormous a structure could leave the Earth, and yet there one went, gliding past in the sky above. The wings looked nothing like the canvas-and-strut arrangements of the planes that Titus knew. And no propellers! How did the thing move itself then? Another huge class of things that he didn't know and probably would never grasp.

He surveyed the crowd as Lash had asked. Still no sign of Shell. But surely that was a familiar hock-bottle silhouette just emerging from a side lounge? So many new faces had poured into his life that Titus had to think for a moment. This plump matronly partridge was surely the Doomster advocate who had been sitting at the table in the plaza. And yes, there was the son who had inherited her unfortunate physique, following behind and carrying the baggage.

Without thinking about it, Titus leaped to his feet and followed. It had been rather a mistake to try to bullock his detractors, more productive of heat than light. Surely reasoned argument would put paid to this nonsense now and forever? And it was safe enough, if airports were a sanctuary. "Madam, a word," he called, catching up.

At the sight of him, the pear-shaped young man almost dropped a bag. "God, it's him again!"

She flushed pink, but didn't slow down. "Captain Oates, I'm not going to be persecuted by you!"

"Persecuted? That's like your sauce, when it's your lot gunning for me!" But damn it, he was not going to get diverted into a tirade. "All I'd like to do is talk to other members of your organization. You happen to be the only one I recognize by sight."

"We're in the phone book," she snapped, picking up her pace.

"The what?" He had to stretch his legs to keep up. Why would they use unfamiliar terms? He would have to ask Lash—

"Wait." She halted in her tracks so abruptly that both he and the lad swept right past her. "What you were saying in the plaza. . . . Would you really? Come with me, to an executive meeting maybe?"

"Certainly. I said I would, and a man's word is his bond."

"It's a *wonderful* idea!" She gazed at him as if he was the plum she'd pulled from a Christmas cake.

A slow thinker, but Titus reminded himself that women could not have a man's natural gift for affairs. "At any convenient time," he said magnanimously.


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"Right now would be perfect!"

The plump youth stared open-mouthed at his mother. "Ma, are you sure about this?"

"Don't nag, Roger," she said, taking out her machine. "I want to link to Steve right away."

"You might mention to Lash the change in plan," Titus suggested. How easily one became accustomed to the convenience of chattering to any person from a distance at any moment!

"Of course, Captain. Don't worry about it."

"But Ma, we're going to Toronto!"

"Not any more we're not, Roger dear. Find us a taxi, would you?"

The youth led them through the airport maze to an exit where the driverless taxis waited in a long queue. They climbed into a passenger compartment and sped off. At the further side, the woman dived into her little machine the way one would into a book. Doubtless when the meeting was arranged she would be free to converse. Titus eyed the plump youth, hunched beside him in the middle seat as if he wished devoutly to be elsewhere. Insist on human status, he reminded himself. Connect! "You know I'm Oates, of course. What's your name?"

"Sorry—Brabazon. Roger Brabazon."

"And your mother here is Mrs. Brabazon?"

"No, she's Rena Zonderman. Look—is there any way you can get back to 1912?"

"They said it was impossible."

"That's what they always say. But are you sure? Because if it really is impossible, then . . . "

He seemed unwilling or unable to finish the thought. "I was in a damn tight place when I stepped out of 1912," Titus recalled. "Freezing, starving, and dying of gangrene. I'd as lief not pick up precisely where I left off."

"You're in a damn tight place *now*."

Titus stared in astonishment. There was nothing dangerous about riding in taxis as long as he kept his hands away from the door latch. But before he could demand more information, Mrs. Zonderman prodded her machine until it squawked. "I'm surrounded by idiots," she exclaimed. "Wasn't it one of you British history guys, who said that great plans should leave room for improvisation?"

"Arthur Wellesley, Duke of Wellington," Titus offered.

"You see?" she told her machine crossly. "Exactly what I've been saying."

"You mean you have him *there?* " it demanded in horrified tones. Disgusted, she folded the device shut without answering.

"You can't compare yourself to the Iron Duke," Titus said indulgently. "He was Napoleon's nemesis, the greatest general Britain's ever produced."

Mrs. Zonderman had turned her attention to the taxi's little passenger control panel, pressing buttons with an assured hand. "Well, as a matter of fact, I think the comparison's very apt. I'm obliged to you for the name—I'll have to look the Duke up. Would you step out of the car now, Captain?"

"Certainly. Have we arrived?"

"We're just switching cars. After you."

The motor halted and the door at his elbow popped open. Courteously, Titus stepped out. Without wasting a second, the door slammed shut again and the vehicle accelerated, speeding away into traffic. In an eyeblink, it was gone.

"What the devil?" Titus stared after it, his mouth dropping open in astonishment. Where were the other two going? Wasn't there supposed to be another motor? He looked round, taking in his surroundings. He was standing on a strip of concrete less than eight inches wide. To either side of him, huge motors whipped by, as big as locomotives and faster, the roar of their engines like continuous thunder. The wind of their passage battered at him like blizzard gales. He had spoken to Lash blithely of perfect balance, the mental ability to


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stand tiptoe on top of a fence post. Now he had to demonstrate it. He closed his mouth against the hot dust thrashed up by thousands of passing tyres, very carefully not moving an inch, and gulped.

Lash had alluded to modern rules of the road—that traffic was organized in lanes, for instance. Titus counted the lanes on this roadway. There were twenty-five in one direction, parting to flow past his island the way a river in full spate would surge round a rock. Somewhere nearby must be twenty-five lanes heading the other way. Perhaps above or below—other roadways soared overhead and swept to the right or the left, curving up or diving down, carving the daylight into slabs and slices. The rhythmic glassy flicker from the windscreens as they arrowed through a shaft of morning sunlight was faster than his pulse, almost hypnotic. Was this even real? It would have made a convincingly horrid nightmare. But this could not be nightmare. It was beyond any dream he could imagine.

Titus pushed aside all questions for later consideration. Ride each fence as it comes—the challenge now was to get to safety. To stay here for any length of time was impossible. It was too narrow to even sit down. A motor with a wide load might speed by at any instant. And even a momentary loss of footing would bring him tumbling under the whizzing wheels—there would be no amiable crowd of city pedestrians to haul him to safety.

He considered waving down a passing car. Did motorists offer lifts to pedestrians any more? None of the huge segmented cargo vehicles thundering past had drivers, and the smaller passenger motors were obviously also being managed by machine. Autopilots, that was the term Lash had used—the only way that millions of vehicles could speed along inches apart at over a hundred miles per hour without smashups. Lash had blanched at the idea of his learning to drive, but in Titus's estimation this was not driving. Occasionally he glimpsed an automobile passenger reading or consulting a little machine, never watching the road. Anyone who happened to glance idly up would think nothing of a man, a workman perhaps, standing in the roadway.

Obviously the thing to do was to nip smartly across the road to the verge. Traffic was dense but not impenetrable—there were occasional gaps between the vehicles. He could choose his moment and make a dash for it. There were fifteen lanes to the left, but only ten lanes to the right, so that was the best direction to go. He breathed down a deep gulp of the hot fume-laden air, plucking up his courage. There was no time to waste in dizziness and chronal distress. He had crossed modern streets before. He could do it again. He had trodden more difficult paths in his day.

Now! He stiffened the sinews and ran, dodging neatly across one, two, six, eight lanes of traffic as sweet as a fox threading through a hedge before the hounds. But as he raced towards the kerb, a towering goods vehicle towing two waggons hooted its horn at him, so that he nearly jumped out of his skin. It was only an instant's loss of timing in his dance with peril, immediately recovered, but that was enough. A motor whizzed by too close, nearly nipping his toes. The blast of its passage blinded him. Something struck him a stunning, glancing blow and snagged his garments. He was jerked off his feet before the flimsy modern cloth tore away, and rolled over and over breathless and bruised to safety on the narrow pavement.

Titus huddled on the gritty surface, gasping. By God, that had been as close a squeak as he ever cared to have! And when he sat up, he found that it had all been for naught. This strip of pavement was perhaps twice as wide as his former perch and edged with a low wall. When he dragged himself up to look over, there was nothing beyond but another


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roadway crossing at an angle far below. It too teemed with vehicular traffic. And beyond that was another, and then another. There was no way out of this deadly maze on foot.

At least this new pavement was wide enough to sit on. Titus licked the blood off his scraped knuckles and picked embedded gravel from his knees, all the while expressing his feelings in the most dry and picturesque emergency vocabulary he could muster. His shirt had been ripped asunder, and a jagged triangle had been torn from one side of his trousers—some protrusion on the motor must have caught a pocket. When he staggered to his feet, his tattered garments showed little inclination to follow. He had to hold his grimy trousers up with both hands. His tatterdemalion appearance would make a bishop grin.

Suddenly, the humour of the situation did strike him. He sat on the low wall and sniggered at his plight. Debagged, alone and helpless! It reminded him of the elaborate boarding school japes in the *Stalky* stories. And as he laughed, the solution came to him—a schoolboy prank to extricate himself from a schoolboy dilemma. The task was to signal to the infrequent observers that he needed rescue—to communicate. And it could be done! He was no Miranda, nor an alien Fortie to be clumsily signalled by dancing and gesture. Here and now, it was time to connect. If he could do this, assert his reality and fellowship with every person whizzing by, he might hope to someday put paid to those Doomsters once and for all.

He stood up and turned his back on the highway, gazing nobly out over the wall at the tangle of roadways below, and folded his arms. Unsupported, the remnants of his trousers immediately gave up the unequal struggle with gravity. They collapsed round his ankles, leaving his bare arse exposed to the winds. It was a pity he had no watch. Otherwise he could time exactly how long a man could do a moon job on passing traffic in this era, before some scandalized passenger glimpsed his bum and tattled into a little machine.

He was still chuckling at his own cleverness when a vehicle passed, slowed down, and stopped with a squeal of tyres. POLICE was stenciled prominently on the rear panel, and ominous red and blue lights flashed in echelon on the roof. A frowning uniformed officer emerged. "Mister, what in hell are you playing at?"

Titus hitched his trousers up again. "Good day, constable," he said cheerily. "Before you bring me up before the Beak, I wonder if you would oblige me by contacting Dr. Kevin Lash of the PTI-CA-TTD. I last saw him in a lounge at the airport, waiting for a flight to Wyoming. And if you happen to have a spare belt on hand, I should be most grateful."

There was the usual argy-bargy and delay while frantic messages winged back and forth through the little machines, but eventually it all ended as Titus knew it must, in a short ride back to the airport. When they pulled up at an entryway, he saw familiar faces in the throng.

"Titus!" Shell leaped to the rescue with Miranda in tow. "You're hurt!"

"He's ours, we're in charge!" Lash exclaimed. "Officer, whatever the problem is, I can explain everything!"

His self-congratulatory mood vanished when Titus saw that it was Miranda's impaired behavior that turned the tide. The police officer looked from Titus, holding his battered trousers up with both hands, to the child swaying from one foot to the other, and his tone became one of lofty kindness. "Ma'am, traveling with two disabled persons is going to call for more manpower than you got. You have to keep them under your control. Did you download the regulations that apply to air travel with persons of diminished capacity?" Only Lash's pleading expression kept the hot words between Titus's teeth.

In the end, they were saved by their


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flight's imminent departure—it had already been held up while Titus was returned to the fold. Titus was accustomed to seeing his mode of travel—the locomotive or ship or whatever. It was disappointing to board through a tube, so that nothing could be seen of the jetwing itself at all. He might have been walking down a rather narrow and curving corridor in the bowels of the airport building. And the travelling compartment was enormously large but very low in the ceiling, packed with rows of seats full of passengers who gaped at his rags. "Where does the driver sit?" Titus demanded, balking.

"Come along, don't block the aisle," Lash said.

"Miranda gets the window seat," Shell said grimly. "You are sitting right here between Kev and me, where we can keep hold of you. Kev is going to lend you his belt, to keep you decent. And I have safety pins for your shirt, and a first-aid kit. Let me patch up your shins before Sabrina goes ballistic."

"Titus, what happened?" To Shell, Lash added, "He was sitting beside me all snug and tight, and then he vanished!"

Titus told the entire story, distracted by Shell's ministrations—she hardly needed to roll up his trouser leg to wipe off the blood, the fabric was so raveled. Lash's little machine glowed softly. His words were somehow being shared with the rest of the TTD. But it was important that they be caught up—Lash had been obliged to reveal their names and business to the police officer, and for certain the news would leak out. So he made his account clear and complete, recounting every word of the conversation with young Brabazon and Mrs. Zonderman. "I still don't understand where it went sour," he concluded. "It was a damned odd place to change vehicles."

"Shell, this time they've blown themselves wide open." Lash's pale face flushed with excitement. "It's attempted murder."

"Come now, Lash," Titus protested. "Letting a man out of a motor is hardly malicious."

"Letting *you* out, on a major freeway interchange? Titus, don't you see? You couldn't find a tidier way to kill someone who can't manage modern traffic if you worked at it with both hands for a week." Shell folded the unused sticking plasters back into her first-aid box with an unfaltering hand, but fury had dashed the color from her cheeks. "Look at your injuries—it's a miracle you weren't killed. It's like tossing a child or a dog out onto the highway!"

"Deliberately putting Titus into peril." Lash clicked busily away at his machine. "Oh, we've got them now. Probably not on legal grounds—"

Shell blew out an indignant breath. "What more evidence can the police possibly need?"

"Well, he *has* been known to open a moving car's door before, Shell. She'll just say it was his own idea. But at least Rick can spin this so that we get the moral high ground."

Titus slumped in his seat, aghast. Another attempt on his life—such an important and vital event, and he had not even noticed! Mrs. Zonderman had mentioned the plaza, where he had brashly invited her to take a shot at him—a suggestion that in retrospect was like offering a lioness the first bite. Presented with a chance-met opportunity, she had frozen onto it as cleverly as Napoleon or Wellington, coming to an immediate decision and swiftly developing an ideal murder method. And not an iota of proof—she hadn't touched him, and he had opened the door with his own hand. Never, under any circumstance, would he ever underestimate a female again. "A child or a pet indeed," he said bitterly. "And not a bright one either. Dear God, this is unbearable. I'd be better off dead in the blizzard."

"Oh no, Titus!"

"It's not so bad as that," Shell chimed


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in almost in the same breath. "I really do know what I'm talking about on this, Titus, so believe me, okay? It's not you, in there, that has a problem." Her forefinger tapped briskly on his chest. "And it's not us either, out here. The problem is here, in the space between." She flapped a plump competent hand in the air between them. "You just have to learn to make the right noises, to connect, to get through to other folks."

"In other words, everything I've learnt in my life is useless, and I have to shovel it over the side and begin again."

"But Titus, you *did* connect. Beautifully! You got the attention of the highway patrol to rescue you, as smart as if you'd lived here all your life. I wish you could've seen poor Kev's face, when the State Highway Patrol linked to say they'd nabbed a flasher."

She giggled at the memory so that Titus had to smile too. After all, he had not done so badly, to escape with his life. Christ knew he had proven in the past that the true victory was to live, to fight or explore or laugh another day. And he had won more. If he truly made a go of traveling through time, he'd be the only human being in existence who'd lived in an alien culture. Surely some sort of career could be made of that! Their plane was still maneuvering along the tarmac, not yet ready to take to the air, and the blue daylight sky veiled the complex new stars man had set in the heavens. He leaned back in his seat to peer out the window. What was space travel but a different style of exploration? ■

*(EDITOR'S NOTE: Titus began his futuristic adventure in "May Be Some Time" [April 2001].)*

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**Dark as Day**, Charles Sheffield, TOR, $27.95, 480 pp. (ISBN: 0-31287634-3).

**Appleseed**, John Clute, TOR, $25.95, 337 pp. (ISBN: 0-765-30378-7).

**Second Contact**, J. D. Austin, Ace, $5.99, 199 pp. (ISBN: 0-441-00879-8).

**Transcension**, Damien Broderick, TOR, $25.95, 349 pp. (ISBN: 0-765-30369-8).

**The Tomorrow Log**, Sharon Lee and Steve Miller, Embiid Publishing (http://www.embiid.net), Embiid Edition: $4.99 (ISBN: 1-58787-130-0), Rocket Edition: $5.99 (ISBN: 1-58787-131-9).

**MacIntyre's Improbable Bestiary: Perverse Verse & Odious Odes**, F. Gwynplaine MacIntyre, Wildside & Zadok Allen, $15, 158 pp. (ISBN: 1-58715-472-2).

**Robert Silverberg Presents: The Great SF Stories (1964)**, Robert Silverberg and Martin H. Greenberg, NESFA Press (Box 809, Framingham, MA 01701 (www.nesfapress.com), $25 + $3 s&h, 385 pp. (ISBN: 1-886778-21-3).

**Being Gardner Dozois**, Michael Swanwick, Old Earth Books (P. O. Box 19951, Baltimore, MD 21211), $25, 248 pp. (ISBN: 1-882968-19-0).

**West of the Sun**, Edgar Pangborn, Old Earth Books (P. O. Box 19951, Baltimore, MD 21211), $25, 242 pp. (ISBN: 1-882968-20-4).

**Alien Emergencies**, James White, TOR, $19.95, 606 pp. (ISBN: 0-312-87770-6).

**Hunting the Snark and Other Short Novels**, Mike Resnick, Five Star (295 Kennedy Memorial Drive, Waterville, ME 04901, 207-859-1000), $24.95, 241 pp. (ISBN: 0-7862-3878-X).

**In Another Country and Other Short Novels**, Robert Silverberg, Five Star (295 Kennedy Memorial Drive, Waterville, ME 04901, 207-859-1000), $24.95, 300 pp. (ISBN: 0-7862-3876-3).

**Immersion and Other Short Novels**, Gregory Benford, Five Star (295 Kennedy Memorial Drive, Waterville, ME 04901, 207-859-1000), $23.95, 244 pp. (ISBN: 0-7862-3877-1).

**Behind the Eyes of Dreamers and Other Short Novels**, Pamela Sargent, Five Star (295 Kennedy Memorial Drive, Waterville, ME 04901, 207-859-1000), $23.95, 214 pp. (ISBN: 0-7862-3879-8).

Charles Sheffield's **Dark as Day** is set in the same future as his *Cold as Ice* (reviewed here in the November 1992 column) and *The Ganymede Club* (July 1996), not long after a war between the Belt and the Inner Worlds has rendered Earth's northern hemisphere uninhabitable (killing billions), wiped out half of Mars's population of seventeen million, and virtually destroyed the Belt. What's left of civilization is centered among the moons of Jupiter and moving outward.

The earlier novels introduced the Puzzle Network, computer geeks and others who pose each other conundra.


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Some of these geeks, such as the reclusive Rustum ("Bat") Battachariya, even play Sherlock in the larger world at times. Bat's motivations center on food and his collection of weapons left over from the late war. Currently, he is interested in something that exists only as a rumor, a doomsday device that would have destroyed all of civilization by turning the entire Solar System "dark as day," whatever that means. On a more mundane level, he is abandoning his cavern deep inside Ganymede for a less crowded venue in Saturn's moon Pandora. Here, he hopes, he will be left alone.

But . . . on Earth, a young man and a young woman, Sebastian Birch and Janeed Jannex, have taken the tests and are awaiting word. As children, they were plucked from the devastation of Earth's Northern Hemisphere, memory-wiped (to spare them trauma), and raised as refugees. Now they have make-work jobs on an ocean-mining platform and dream of emigrating to the Outer Worlds. Thus the test, and thus their joy when they are accepted—though something does seem odd, for the Belt's personnel recruiter is extraordinarily interested in Sebastian, who has a deeply intuitive grasp of atmospheric hydrodynamics, as embodied in the cloud patterns of Jupiter and Saturn, and who has strange microscopic spherules in his blood cells.

Aboard ship (the *Achilles*, captained by Eric Kondo), Janeed meets First Officer Paul Marr. In due time, they will save the System and go off to seek a suitable sunset.

On Ganymede, Alex Ligon is perfecting a computer model of human civilization, but the results are quite strange—apparently humanity will soon be extinct! Not that his family cares—they are the Ligons of Ligon Industries, and they think it much more important that they gain access to Pandora, and no matter that a certain eccentric recluse has a long-term lease on the rock.

System-wide, the Seine is going online. The Seine is a new sort of computer network, using quantum entanglement to link every computer and database in the system. Computing power will leap tremendously! Not that it helps Alex and his computer model.

At the Trojan L-4 point, Milly Wu has just joined Jack Beston's SETI project (brother Philip has a competing operation at L-5) and promptly stumbled on an intriguing apparent signal which turns out to have a decidedly strange effect on Alex's computer model.

Sheffield leaves enough loose ends for another volume or two in the series, but he does an excellent job of bringing all his threads together. The result is a novel that should appeal very much to *Analog* readers.

Perhaps, one of these days, it will also appeal to a producer. It is easy to imagine this series on the Sci-Fi Channel.

Rich with nanotechnology and artificial intelligences (or Made Minds), John Clute's **Appleseed** thoroughly blurs the boundary between actual and virtual reality. Two thousand years from now, trader Nathaniel Freer is approaching the world of Trencher, his Quantum Mind aide, Kirtt, stripped down to its computer-compatible kernel that is all that is allowed close to a world. The walls of his ancient ship are studded with tiles that act out dramas in the mode of classic Portuguese azulejarias and with masks that can serve as mobile hosts for Made Minds and the krewe of lesser artificial intelligences that help run the ship. Freer's mission is to pick up a cargo of nanoforges destined for the planet of Eolhxir, but he is being watched by nefarious forces. While he is on-world, they attack, destroying billions of alien sentients in an effort to snare him. They fail, and Freer escapes even as Trencher falls prey to "plaque," a petrifaction of the data on which civilization runs and which all worlds fear. Indeed, Earth long ago died, lost to a


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sort of artificial Alzheimer's disease.

The enemy attacks again. Freer escapes, but with damage. Fortunately, the cargo has come with an alien who knows the route to Eolhxir. She steers them to a safe haven run by—of all people!—Johnny Appleseed himself.

Okay. Clute is clearly having fun. The story has a nice, active plot, full of chases and escapes and culminating in the revelation that Freer and his ship are crucial to the future of civilization. You can't possibly be disappointed on this level.

The story is also quite feverishly inventive. Novelties proliferate on every page to the vast delight of the neophilic reader, and Clute makes them all make sense. They fit their context and lend richness to the world in ways that most other writers can only approximate.

But Johnny Appleseed? Well, that's not the only nod to literary history. As Clute says in his acknowledgements section, he has lifted concepts, tropes, phrases, and images from a host of works. He mentions Baum and Borges, Disch and Kipling, Clarke and Wolfe, and adds that "There are, I know, further explicit debts which have sunk too deep into memory to surface when I call." The experienced reader is bound to find many echoes to draw a smile or nod of recognition and to lend a sense of vast depth to the world Clute has painted.

Yet one can cavil a bit. Clute claims here that humans are unique in at least two respects. First, no matter what they're doing, they're really playing the mating game. Second, they stink; indeed Kirtt's nickname for Freer is "Stinky."

The first I'll grant. After all, many creatures that reproduce sexually do it seasonally. They are not capable of constant, year-round sex, as we are. But the second seems quite unlikely; *all* (or most) living things—humans, dogs, cats, cows, lobsters, ladybugs, roses, pine trees, etc.—stink, even to the insensitive human nose. Clute's claim that we are unique in this—I doubt that alien organic lifeforms will be any different—thus hampers the "willing suspension of disbelief" and weakens the story as a whole.

Never mind. *Appleseed* is nevertheless a marvelous and engaging tale. Don't miss it.

J. D. Austin's **Second Contact** isn't as much fun as *Bobby's Girl* (reviewed here November 2001), but it will do. The largest flaw—for one of *Analog* ical bent—comes in the very first paragraph, where Austin (better known as Joshua Dann) says that "Millions of years ago [and] galaxies away, so far that even astronomers referred to it as simply 'way the hell out there,' another planet was painfully inching its cosmological way forward" and thereby displays an insensitivity to temporal and spatial scale that must cause a pained wince.

The planet in question is Kivlan, thoroughly Earth-like and inhabited by some pretty human sorts, though their skins are blue and their dispositions are more peaceable. It is thus a bit out of character that in 2039, when the Earth ship *GSS Lifespring* approaches, they say "Geddoudahere" and add a shot across the bow for punctuation. Humans being persistent buggers, it isn't long before the *Forlorn Hope* is sent to knock on the Kivlan door again, this time with a sizable billyclub held behind the back.

But the Kivlanese aren't really bellicose. They just aren't fit for company, since they're suffering a sort of planetary PMS that hits them every 700 years or so. This time they let the humans land, romance blooms, and when one PMStic Kevlanese general decides it's time for a coup, the humans have a front-row seat to see how the locals handle such things.

The contrast with Earthly methods is both marked and deliberate. Austin is engaging in that venerable sfnal sport of showing how sensible and happy we could be, if only we did things *this* way.



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Planetary PMS? If only we could blame our own temperishness on such a thing!

Damien Broderick's last book was *The Spike* (reviewed in my July/August 2001 column), in which he waxed enthusiastic about the prospects of a Vingean "singularity," that moment when the curve of technological progress goes vertical and we lose all our ability to imagine the future. His emphasis was on nanotechnology, computers, artificial intelligence, and mental uploads, all areas whose prospects enchant some, alarm others, and stir much debate over both how likely they are (Are science fictional nanotech, AI, and mind uploads little more than fantasy? Or are they just a matter of time, and surprisingly little time at that?) and how desirable they are. Writers such as Bill Joy have found some of the prospects so alarming that they have called for humanity to deliberately foreswear developing some of these technologies ("Why the Future Doesn't Need Us," *Wired*, April 2000).

Joy's approach does not seem very likely. Scientific and technological development has a certain momentum. Some analysts argue that that momentum is so great that technology is in charge of us, not vice versa. Surely these people would find Joy's argument congenial and happily relinquish the prospects of nanotech or AI. In fact, in the past they have said similar things about other technologies, from looms (the original Luddites) to automobiles and nuclear power and recombinant DNA. Among the latest examples is the attempt to block genetic therapies that might affect the gonads because of the "risk" of creating a transgenic human.

And here is where Broderick returns to the fray with **Transcension**. His world is an Earth in the throes of "Joyous Relinquishment." People have in fact forsworn certain avenues of technological development, although they enjoy technologies well ahead of the ones we are accustomed to. For instance, kids remain kids, or "penders," until age thirty, at which time they undergo hormonal treatments to trigger physical adulthood. During penderhood, they gain education, engage in Play (which looks like career to us), and goof off. Big time! For instance, meet Amanda, who with her buddy Vik, is trying to hop a ride on a supersonic freight train. They get caught and hauled before the Magistrate, Mohammed Abdel-Malik, who had been a founding father of AI until muggers killed him and his head was frozen; in due time his corpse was revived (apparently, Relinquishment meant that researchers proved they could do it with him and then closed the shop without reviving anyone else). The sentence is grounding, but Amanda does not give up on her larks easily. Soon she is scouting the Valley of the God of One's Choice reservation, where the seriously retro live—they've relinquished even tractors in favor of an American Gothic lifestyle. Amanda's mother has been part of an effort to suborn the valley folk, at least enough to get permission to run a freight line in a tunnel under the valley. Now there's a ventilation shaft poking up through a field, and Amanda figures that she and Vik can sneak into the valley, climb down the shaft, and hop a freight without getting caught.

Unfortunately, when they try it, a local yokel, Mathewmark Fisher, follows them down the shaft and, as Vik gets killed, is so seriously injured that the only fix is a computer implant to replace lost chunks of brain. This is a problem for him, for now that he has the devil's machines inside his head, he can't go home. Amanda's new sentence is to baby-sit him, bringing him up to speed.

Unfortunately, he *really* wants to go home. His twit of a true love is there, after all, and it doesn't really matter that he and Amanda are feeling a strong attraction. After all, both are busily denying it!

Meanwhile, Broderick is showing us



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the world as the Magistrate sees it, ruled by a benign AI called Aleph who seems to think of humanity as both parent and child. Aleph has an agenda that does not seem to be very consistent with what any of the other characters think, and the chief clue I'll tell you about here is that Aleph's mind was originally seeded by the Magistrate's own, and the Magistrate, in his first life, was an exponent of anything but Relinquishment. A lesser clue is that when Amanda tries to access information about a distant part of the world, the information is blocked. Another is the valley itself.

Meanwhile, Mathewmark goes home after all, and a wedding is soon lined up. Amanda goes in for her maturity treatments. Aleph's interstellar probes return with certain information. And things fall apart about as thoroughly as they can—except that this means disaster only to the shortsighted.

Overall, *Transcension* is as fine a novel as Broderick has ever done. My only real cavil is that he has Amanda speaking in an extraordinarily tiresome "Mall cant." This is tolerable in dialog, but excessive in larger quantities, as when Amanda takes a turn as narrator. Fortunately, the reader does grow used to it in time, and Broderick's hand does grow lighter.

As I've said before, Embiid Publishing (http://www.embiid.net) is doing a nice job of electronic publishing. The latest is Sharon Lee's and Steve Miller's **The Tomorrow Log**, which begins a new series. Readers familiar with the Liaiden novels will not be disappointed.

The protagonist, Gem ser Edreth, is a thief of great skill, but his lucrative career is threatened when he turns down a commission from the chief of the local underworld, the Vornet. At the same time, he is approached by one Corbinye Faztherot, who calls him Captain-to-Be as foretold in the Tomorrow Log, and reminds that even though he was at age nine sold into slavery by his uncle, he is of the Ship and owes it loyalty. He also, according to the Tomorrow Log, will get the Ship out of a serious jam.

Alas, Corbinye lets it be known that she is his cousin. The Vornet chief has her snatched, the better to put pressure on Gem. When she resists, she is so seriously injured that her mind must be transferred into a new body. And Gem acquiesces, going forth to steal a mystical totem, the Trident of the Bindalche.

He very quickly realizes that the Trident is no mere totem, but an ancient device of rare and wondrous powers. Soon the Vornet are in disarray and Gem, Corbinye, and the Bindalche Witness whose mission it is to see and remember all the wonders that accompany the Trident's shakings of Events, are on their way to the Ship, where adventures await and both Ship and Bindalche will be set upon new paths.

If you want to try out a digital book on your PC or laptop, this one will do nicely. Lee and Miller are consistently deft and smooth. The tale has momentum from the first page (or screen) and never lets it lag.

If you insist on paper, you'll be missing a good one.

F. Gwynplaine MacIntyre has been publishing witty verses (he has a very good time in old-fashioned rhyme, and so will you if you can part with a ten, three, and two) and short stories for over twenty years. A number of these verses concern improbable beasts such as yetis, Heisenbergs, trolls, doppelgangers, and bumps in the night, and you will find them all in **MacIntyre's Improbable Bestiary: Perverse Verse & Odious Odes**, along with a few of the short stories. "Martian Walkabout" has an Australian Mars-naut decide to go for a stroll. "The Man Who Split in Twain" confronts the author with both the ghost of Mark Twain and Twain's astral twin.

Have fun!

* * *



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In 1979, Isaac Asimov and Martin H. Greenberg began what eventually became a 25-volume anthology series, each volume collecting the best or most memorable stories of a year. The first such year was 1939; the last was 1963, the year before the Terry Carr/Don Wollheim "best of the year" collections began. Now NESFA, recognizing that the Carr/Wollheim volumes are long out of print, has asked Robert Silverberg to pick up Asimov's half of the editorial baton and carry the original series onward. The first volume is thus **The Great SF Stories (1964)**, and I need hardly do more to commend it to your attention than to list the authors of the stories it contains: Norman Spinrad, Jack Vance, Poul Anderson, Cordwainer Smith, Roger Zelazny, Leigh Brackett, John Brunner, Gordon R. Dickson, Wyman Guin, Ursula K. Le Guin, Fritz Leiber, Frederik Pohl, Fred Saberhagen, Robert Silverberg, and Norman Kagan. Many of these people were already major figures in the field. Some would soon be stars. One or two—Wyman Guin and Norman Kagan—have vanished from our ken, though at the time they were remarkable enough.

Classic stories all, from a time as rich in memory as any Golden Age SF has ever known.

Interested in editors? Just for you, Michael Swanwick has interviewed one of the greats and prepared **Being Gardner Dozois**. However, this isn't about being an editor. Dozois is also a writer, and his fiction—beginning in 1966—occupies a niche all its own in the SF library. This fiction is Swanwick's focus in his "bravura homage to a friend that goes beyond the norm" (so sayeth the jacket copy).

With luck, Dozois will prove wrong in his comment (from p. 243) that "there's about five people in the world who are going to want to read this book." However, Old Earth Books is very much a small press. If they believed Dozois, you'd better hurry up and order yours.

**NOTABLE REISSUES**

Edgar Pangborn is best known for *Davy* (1964), but he also did a number of other novels, in and out of SF. **West of the Sun** (1953) was his first, and its tale of struggling to survive a strange world of beauty and terrifying monsters, witches, and cannibals was an entirely suitable introduction to a grand talent.

The late James White is famous for his Sector General novels, conceived as a medical-crisis alternative to conventional militaristic SF. In **Alien Emergencies**, you will find three of the novels—*Ambulance Ship*, *Sector General* (reviewed here Mid-September 1983), and *Star Healer* (August 1985), along with an introduction by David Langford and a historical essay by White. Oldies but goodies.

And a new imprint, Five Star, from Thorndike Press in Waterville, Maine, brings us Mike Resnick's "Hunting the Snark," "Redchapel" (Teddy Roosevelt hunts Jack the Ripper), "Bwana," and the multiple-award-winning "Seven Views of Olduvai Gorge" in **Hunting the Snark and Other Short Novels**.

Robert Silverberg gets similar treatment in **In Another Country and Other Short Novels** ("In Another Country" plus "The Way to Spook City," "They Hide, We Seek," and "This Is the Road"), as does Gregory Benford in **Immersion and Other Short Novels** ("Immersion" plus "Matter's End," "To the Storming Gulf," and "Of Space/Time and the River") and Pamela Sargent in **Behind the Eyes of Dreamers and Other Short Novels** ("Dreamers" plus "Shadows" and "The Renewal"). Five Star promises future books starring Spider Robinson, Charles Sheffield, Norman Spinrad, L. Sprague de Camp, Susan Shwartz, Jack L. Chalker, and Christopher Stasheff. ■



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# BRASS TACKS

Dear Dr. Schmidt:

I loved your "Monsters" editorial from the February '02 issue of *Analog,* as it shed some light on human prejudice, but I wonder if you weren't being just a little unfair in your criticisms of the city officials in using a Floridian animal expert to remove the alligator.

It is an unfortunate fact that everything a politician does is subject to minute scrutiny, and I wonder if these city officials might have been acting overcautiously in an unfamiliar situation just because the media was watching.

It is true in many ways that the voting public may be seen as the politician's manager—and who doesn't pull out a policy and procedure manual when the boss is looking over our shoulder?

If something bad—like the death of an endangered animal—happened during the process, these city officials would be able to say, in good faith, that they have done the best that they could to protect all concerned.

It is not difficult to imagine the trouble that might befall a politician if a protected animal died (perhaps through no fault of the handler) when he or she was seen to have cut corners after the fact.

Kevin Levites

*You may well be onto something here—but how is a keeper from a Florida tourist "attraction" better than a curator from the Bronx Zoo, world-famous for not only its animal displays but its animal research?*

Sir:

In many of your editorials, you bring up the notion of "return to (Earth's) gravity." An unexpressed assumption on your part seems to be that anyone who goes into space will automatically want to do so. This is far from being so.

Not everyone who ventures into space will want to return to Earth—even from the very beginning of exploration. Although this fact is recognized in many science fiction stories, neither you (in your editorials) nor NASA (in its plans and proposals) accept it as a valid alternative worthy of consideration.

Many of the problems associated with adaptation to living in space (and in other gravitational environments) can truly be studied only by immersing individuals in these situations and then observing how they (and their bodies) respond. This includes issues of "life support."

I have heard a theory expressed that the body, when exposed long enough to new circumstances, will come to a new "balance" in order to survive in the new situation. Only long-term immersion in the situation will determine when (or if) such a balance may actually occur. In arriving at this determination, problems (or non-problems) of life support will also be revealed. After all, even on Earth, the conditions under which one person can survive may be totally beyond the capabilities of someone else to endure. (Cultural biases will need to be unlearned just as much as bad science.)

Among the first individuals to expand into any new frontier are explorers and settlers. Businesses may come later, but they usually need at least some kind of a base to be present first before they can set up their operations. Though busi-


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nesses may enter into space earlier than they have other frontiers, that does not change the fact that (to an unprecedented extent) all of the members of these groups will be guinea pigs.

As guinea pigs, they will need to possess two important qualities: They will need to be volunteers; and, they will need to be good at communication. Note I did not say that they will have to be among "the brightest and the best." Those who observe them to determine how well they are succeeding in their endeavors may need to be so, but these individuals themselves will need mainly good "survival instincts" and the ability to implement them. After all, it is claimed that space will be open to all of humanity and not just "the cream of the crop." Thus, as many facets of humanity as feasible will have to be included in space exploration. And those who wish to be included may not always be those whom one would expect.

I would volunteer in a heartbeat for a one-way trip to orbit, or to the Moon, or to Mars. But when I mentioned this to NASA in connection with the International Space Station, I received only silence from the man on the other end of the phone line. Some of us (for our own private reasons) can offer only our willingness to take risks. If this willingness cannot be accepted by an agency (or others) too hidebound to appreciate the dreams and sacrifices of the crew of the *Challenger* and of the other crews and individuals who have given their all in order to help humanity enter upon this new endeavor then I fear for the future of our planet. Without dreamers and risk-takers there is no future.

Ray Angel

*You make some good points, but I'm a little baffled by your opening remarks. I don't remember even mentioning this subject in many of my editorials, much less assuming that anyone who goes into space will automatically want to do so or not accepting anything else as a valid alternative. Indeed, I have on several occasions pointed out that the argument that interstellar trips won't happen because the travelers can't come home is invalid because our history is already full of people who didn't want to go home—most of our ancestors, for example.*

Dear Dr. Schmidt,

"Make no little plans; they have no magic to stir men's blood . . . Make big plans . . . aim high in hope and work."
—Daniel H. Burnham

I saw a little synergy while reading "The Alternate View" column of John G. Cramer (*Analog*, February 2002) last night. Cramer reports on U.S. particle physicists' desires to build the "Next Linear Collider" (electron and positron accelerators) to advance fundamental physics research. This is a two to six-billion dollar effort that would take four to six years. It requires the construction of a thirty-kilometer tunnel in two segments. The site has not yet been chosen. I infer Cramer believes the world only requires one and would prefer to see the effort lead by the United States in an international consortium, as opposed to leaving U.S. particle physicists out in the cold.

Here is the synergy. Northeast Ohio is in dire need of an economic stimulus and a boost to the professional talent pool, as *The Plain Dealer* has pointed out in Sunday features for months. We have excess manufacturing capacity and a fervent desire to hang on to what we can of it. The NLC is a problem waiting for our hammers.

The Austin Company, based in Cleveland, is capable of the project management. Institutions such as Case Western Reserve University, John Carroll University, Cleveland State University, CAMP, The University of Akron, the John Glenn Research Center of NASA—just a few off



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the top of my head—could contribute to the project and would certainly benefit from it. Our machine shops are second to none. The newly-closed facilities of LTV might provide the requisite construction steel. Or this project could invigorate mills remaining in the area and offset some of the losses in steel jobs. Some of the construction workforce might be drawn from LTV's laid-off employees.

How to appeal to the international community? To begin with, run the collider tunnel from Pelee Island in Canada to Port Clinton or Sandusky. Internationalism in the sciences is seldom practiced this way, and institutions in Toronto will certainly want to participate. Perhaps to some, Canada is just another state in North America, but it's a start. Spread the wealth on to Michigan and Pennsylvania and we start to see a fulcrum for congressional leverage.

If we're successful in this, we might turn our newfound expertise to transportation tunnels ala the English Channel Tunnel (Chunnel), running from Kingsville, Ontario to Pelee Island and on to Ohio. I know causeways and tunnels for Lake Erie have been contemplated in the past.

John Cramer mentions other attributes of a U.S. National Laboratory. It would be "located in a remote and forbidding place, roughly equidistant from all designers and users, and constructed on inexpensive neutral ground where none of its promoters will have an advantage and everybody will be equally uncomfortable." This is everything our detractors have to say of the area, so perhaps this once our detractors will be left with closed mouths.

Harlan R. Cohen

*The author replies:*

Harlan Cohen is interested in having the Next Linear Collider built in Ohio, which he seems to think compares favorably with my suggestion of the Australian Outback. I see nothing wrong with this idea and would suggest that the Ohio enthusiasts form a group and contact the design team based at SLAC about NLC siting possibilities. There's no harm in being early in preparing a siting proposal for a project of this magnitude.

However, two cautionary notes. The site hearings preceding the siting of the SSC in Texas were dominated by NIMBY (not-in-my-back-yard) opponents who were afraid of power lines, tunnels, and anything nuclear. Those interested in NLC siting should deal with the NIMBY folk well in advance of the site selection process. It's perhaps no accident that Texas had the fewest NIMBY opponents and was selected as the SSC site.

Also, I should point out, although Mr. Cohen didn't directly suggest it, that highway tunnels and accelerator tunnels are not really compatible. Accelerators need an environment that is relatively free of the vibrations, particularly the low frequency ones produced by large trucks and trains in highway and railway tunnels. And one reason for putting the accelerator in a tunnel is that it can make (particularly during beam-spill accidents) large amounts of radiation that might not be appreciated by highway traffic next door. The tunneling technology is probably transferable, but the actual tunnels should probably be kept well separated.

John G. Cramer

Dear Editors,

Richard Lovett's article on "Living at the Extremes" was fascinating and extremely timely. I had just finished it when a young woman came into my shop to purchase some products for shipment to Antarctica! She happens to drive a loader for the recycling plant at McMurdo and we had a very lively conversation about the Dry Valley and Lake Vostok and the question of whether to drill or not. Thanks for the interesting reading.

David Green

* * *


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Dear Stan,

I really like "Hominids" but in part II, Robert Sawyer describes native metallic copper as being the most desirable copper ore. Actually, it is the least desirable because it is almost impossible to process efficiently. It would be okay if it were found in uniform BB-size pieces, but Mother Nature is never so kind. The most desirable copper ore is copper oxide ore, which can be used to produce low-cost refined copper using sulfuric acid-leaching followed by solvent-extraction and electrowinning methods.

Ken McClenahan

*The author replies . . .*

I never said native metallic copper was "the most desirable copper ore," but I agree with Mr. McClenahan that finding copper oxide would have been much more valuable, and I award him a penny for his thoughts.

Robert J. Sawyer

Dear Stan,

I am thoroughly enjoying reading your latest serial by Robert J. Sawyer, and am looking forward to finding out how it all ends! I am especially enjoying the descriptions of life in the Neanderthal world.

However, there is a rather major editorial lapse which is thoroughly irritating—not badly enough to spoil the story, but certainly badly enough to intrude—and that is that Sawyer calls his heroes Ponter Boddit and Adikor Huld. Fine—except that they are supposed not to be able to use "ee" sounds (Ponter can't say "Louise", for instance). I would have thought the short "i" would be nearly impossible, too.

Annabel Smyth

*The author replies . . .*

The notion that Neanderthals might have had a slightly reduced vocal range, specifically excluding the "ee" phoneme, comes from supralaryngeal vocal-tract reconstruction work done by Brown University linguist Philip Lieberman (with whom I consulted while creating "Hominids"), and his colleagues.

The names "Ponter Boddit" and "Adikor Huld" have no "ee" phonemes in them; if they did, they'd be spelled "Ponter Boddeet" and "Adeekor Huld."

Indeed, the "i" in "Adikor" is what linguists call a "schwa"—an unstressed neutral vowel sound. Ponter can't properly say "Mary" (phonetically: Mare-ee) or "Louise" (phonetically: Lou-eese) because those names do contain the "ee" phoneme.

Ms. Smyth's statement that "I would have thought the short 'i' would be nearly impossible, too," is an interesting comment, but, since she gives no reason for her belief, I really don't have a response. Although Lieberman's work is controversial (and goes farther than what I chose to incorporate, possibly denying Neanderthals not just "ee," but also the "oo" of the exclamation "boo," and the long-a sound, as well as the consonants G and K), nothing in his work suggested the short-i would have eluded Neanderthals. So: my Neanderthals can make the short-i phoneme, but not the long "ee" one, and I believe I am consistent in that usage throughout the text.

Robert J. Sawyer

Dear Stan,

The people in "Powered by Water" have let me know I missed something. One of the reasons Rudi split up with her husband was that he imbibed a tad too freely, and she pointed out that recovering alcoholics drink much coffee, but no beer. She told Norman to make a no-alcohol version of Blue Bronco Brew, so that these good people would not be left out of the solution, unlike the undeserving Kriegels of the world. To prevent confusion, the label of the no-alcohol version depicts an alert, blue thoroughbred nosing past the finish line rather than its sozzled cousin at the trough.

Mia Molvray ■



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# UPCOMING EVENTS Anthony Lewis

**4–7 July 2002**
WESTERCON 55—CONAGERIE (western science fantasy convention) at Los Angeles Airport Radisson Hotel, Los Angeles CA. Guest of Honor—Harry Turtledove; Artist Guest of Honor—Ross Chamberlain; Editor Guest of Honor—Beth Meacham; Fan Guest of Honor—Robert Lichtman. Registration—$60 to until 28 February 2002; more later and at the door (checks to Westercon 55). Info—Westercon 55, SCIFI, Inc., PO Box 8442, Van Nuys CA 91409; URL—www.westercon.org/55

**5–6 July 2002**
ENDERCON (Orson Scott Card-oriented conference) at Utah Valley State College, Orem UT. Guest—Orson Scott Card. URL—www.hatrack.com/endercon.shtml

**12–14 July 2002**
READERCON 14 (literary-oriented SF conference) at Boston Marriott Burlington, Burlington, MA. Guests of Honor—Octavia E. Butler and Gwyneth Jones. Registration—$30 through 28 February 2002; more thereafter and at the door. Info—Readercon, PO Box 38-1246, Cambridge MA 02238-1246; e-mail—info@readercon.org; URL—www.readercon.org

**26–28 July 2002**
CONFLUENCE 2002 (Pittsburgh area SF conference) at Four Points Sheraton, Pittsburgh PA. Guest of Honor—Hal Clement. Registration—$25 until 8 July 2002, $35 at the door. Info—Confluence, PO Box 3681,Pittsburgh, PA 15230; confluence@spellcaster.org; URL—trfn.clpgh.org/parsec/conflu

**26–28 July 2002**
LIBERTYCON 16 (Chattanooga area SF conference) at Ramada Inn South, East Ridge, TN. Literary Guest of Honor—S.M. Stirling; Artist Guest of Honor—Larry Elmore; Very Special Guest—John Ringo; MC—Darryl Elliot. Registration—$30 until 10 July 2002; $45 at the door. Membership limited to 450. Info—Libertycon 16, PO Box 695, Hixson, TN 37343-0695; e-mail—bspraker@libertycon.org; URL—www.libertycon.org

**29 August–2 September 2002**
CONJOSE/WORLDCON 60 (World Science Fiction Convention) at McEnery Convention Center, San José CA. Guest of Honor—Vernor Vinge; Artist Guest of Honor—David Cherry; Fan Guests of Honor—Bjo & John Trimble; TM—Tad Williams; Imaginary Guest of Honor—Ferdinand Feghoot. Registration until 31 July 2002—attending: USD180/EUR200/CAD285/AUD350/GBP125; supporting: USD35/EUR40/CAD55/AUD70/GBP25; more at the door. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Info—ConJosé, PO Box 61363, Sunnyvale CA 94088-1363; e-mail—info@conjose.org; URL—www.conjose.org

*Convention attendees: When calling conventions for information, do not call collect and do not call too late in the evening. It is best to include a S.A.S.E. when requesting information; include an IRC if the convention is in a different country.* ■


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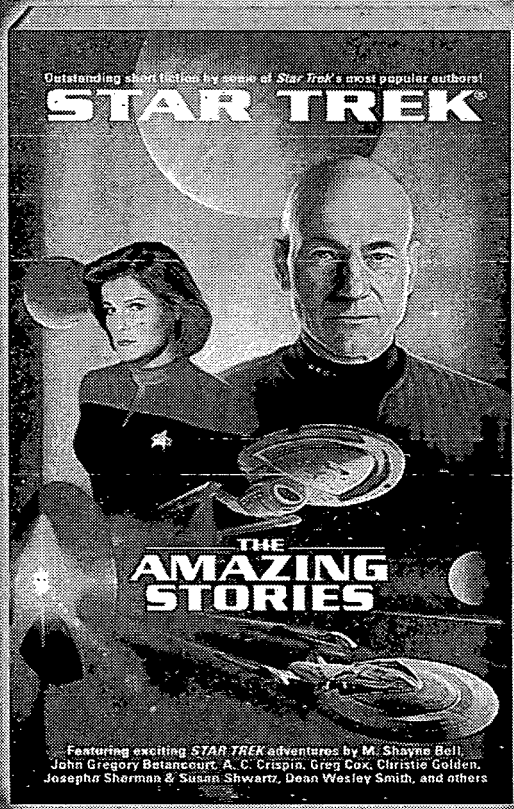
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